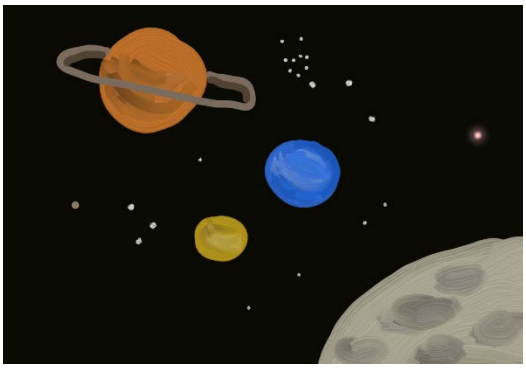
An Imagined Order: Connecting Ideas About Quality Education to Human Communities Living in Outer Space

By Barry Elsey and Amina Omarova



Preface: Self-Directed Learning

At the outset of this learning project, two important points should be made. First, in keeping with the teachings of a great adult educator, the American Malcolm Knowles (1913-1997), we believe that people of mature age, usually with a wealth of lived experience and an abundance of knowledge, from the workplace and life generally, learn best when they can be largely self-directed.[1] Second, as program directors, we do little more than pose the questions that should concentrate your mind on the broad direction and framework of ideas that pave the way for your own exploratory learning.

We treat the first iteration of the learning program as a "work in progress." This is in expectation that adult learners like you are bound to make valuable contribution through your own insights and interpretation to what is truly an exploration of ideas at the frontier of what is known.

You may ask why we have adopted such an open-ended and non-directive approach. One good reason is that an important feature of doctoral research is that a glimmer of an idea is often the starting point for the long learning journey. It simply grows in the mind and becomes a building block for patient desk and field research, combined with inner-directed curiosity and the desire to create knowledge. Your engagement with this program may generate the spark for your own doctoral research topic in due course. Meanwhile, enjoy the learning process of using your curiosity and imagination for creative thinking and patient research.

In the context of this learning program, you are invited to approach knowledge as an "art of the possible" intellectual endeavour owing more to your creative thinking to produce insight and understanding than empirical evidence. Remember, there are no actual communities living like a comprehensive society as we know the concept on Earth. It is for you to create an ideal-type model using the power of reason and imagination. In our experience, the doctoral learning journey is just like that.

Introduction

We are encouraging you not only to explore a feasible design for living community in outer space, but also to devise an ideal-type construction that can inspire others to follow your mind steps. This is the stuff of a grand narrative that engages others in a long conversation. We believe that the Kepler Space Institute (KSI) is a visionary pioneer,

[1] Malcolm S. Knowles, Elwood F. Horton, and Richard A. Swanson, *The Adult Learner* (Oxford: Butterworth-Heinemann, 1998).

which is made more powerful through the contributions of those who follow its learning programs. The notes that follow are written from a lay perspective. We are genuinely curious about the social aspects of living in outer space, but not very technically informed. These general musings are intended to get you starting to think about two big philosophical questions. First, what kind of moral and sustainable living community is possible as a long-term, ordered, and established society in the alien environment of outer space? Second, how can the leading ideas of quality education (QE) play an important role in ensuring that humans can adapt through an educational and learning system designed to enable community living in an extreme environmental context?

We provide no "off the shelf" answers, but instead we challenge you to think, write, and produce an imaginative blueprint for understanding and practical action, to use an old image. Our questions are big, difficult to answer, and undoubtedly challenging to an inquiring mind. The authors know little about the wonders and mysteries of space exploration and permanent human settlement, although one was trained in aerospace engineering in a top Russian university in Moscow several years ago. However, that high level of science and technical knowledge does not go far enough to understand the visionary and bold idea of actual communities of people permanently living in outer space. Our leaning is toward the social aspect of living communities and psychological existence in a completely different environment most of us have not experienced before.

To focus your thoughts, we have produced a simple framework. First, we invite you to consider what "rules for living" should underpin any kind of society that is capable of long-term survival. KSI emphasises the need for a moral order and a social structure that is sustainable. How should these worthy principles be converted into everyday values and norms of behaviour that any living community should follow? Second, we go further to ask how it is possible to live at the individual, inner-psychological level, in enclosed proximity and essential collaboration with others in a strange physical environment, with a huge emphasis on survival and large group behaviour? Almost certainly, such a social order is bound to challenge our notions of personal autonomy and freedom. We elaborate further on these thought lines.

Thinking About Social Systems

Problem Statement. For any human community to exist in outer space, it is necessary to design an integrated social and technical system that is fit for purpose and that can not only survive in an alien environment, but also function as a complete society on a long-term basis.

Finding an Answer. We invite you to write your ideas about how this should be constructed and maintained. We encourage you to be imaginative and bold in your thinking, while keeping close to and informed by those who have written on the subject, whether in the realm of science-fiction or scholarly discourse.

Our thinking, like most others, is influenced by what we know and understand about human society, usually drawing on our lived experiences. In that way, we make simple

assumptions about the general nature of society. We do this by focusing attention on structure and function, such as:

- the economy (the production and exchange of goods and services);
- polity (governance and the making of decisions that affects everyone);
- social order (an underpinning system of law, normative rules, and values for living communities, preferably on some basis of democratic consensus);
- socio-culture (for social cohesion and integration, maintaining the continuities of everyday life, the special roles of family and kin, beliefs, and religious practices, education, leisure, and so on).

Our core assumption is that something like what we know as society will be transferred to outer space, and a new habitat will be formed on a similar basis, at least at the beginning of settlement. What happens next is for us all to wonder about. Indeed, if we are to honour a grand narrative and an imagined order, it is quite possible that the construction of society in outer space will be of a very different kind. That is for you to imagine.

It is a big ask, as the ideal-type model must be more than a specialised space station. It will need a highly skilled workforce dedicated to scheduled tasks as a disciplined team for set periods of time. Any living community would need such a technically competent workforce to maintain the physical system. A whole society, however, is more than that. Somehow, all that we know about living communities on Earth will be transported and relocated in the environment of outer space, and it will need to continue as a whole society.

As many know from lived experience, human society is a messy social construction, seemingly given to dysfunction and discord rather than a smoothly working social system. We may dream of a cohesive and integrated society based on consensus, but we know the realities of social division and conflict. These typically arise through inequities and other divisions by economic class, cultural identity (such as race, gender, religion), and differences in access to and possession of political power to change the course of events and to make things happen. Can they be overcome in a social system that by necessity must live together in harmony or else disintegrate and be destroyed? We briefly return to this theme shortly.

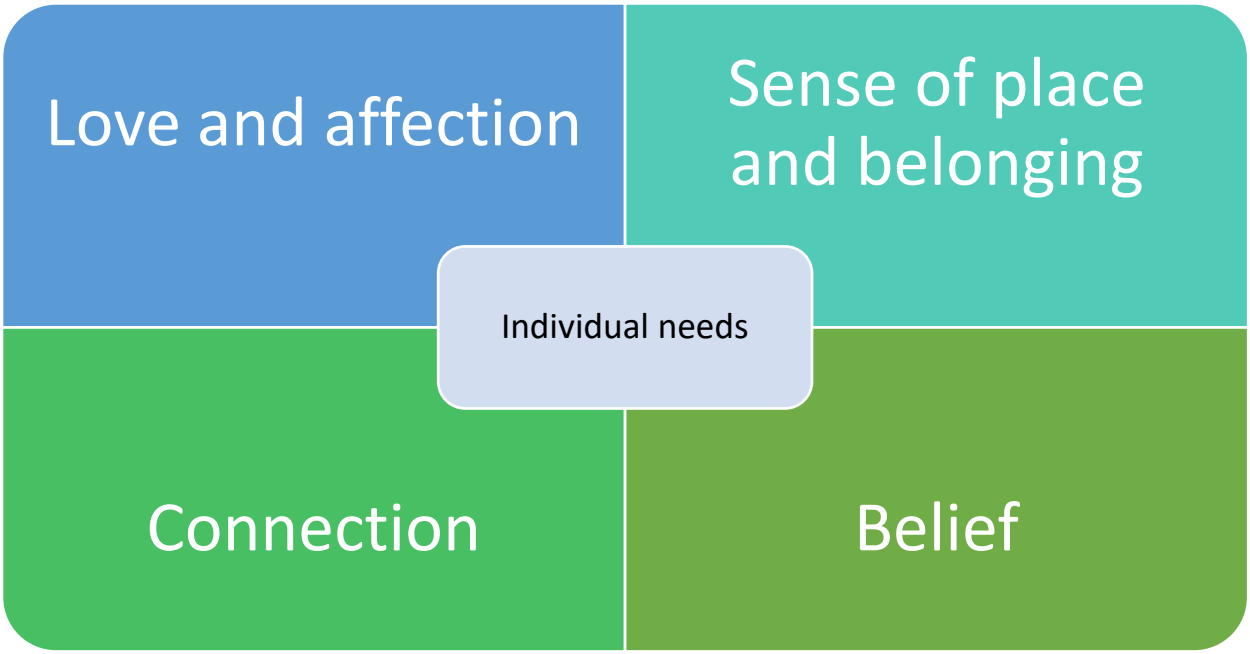
Thinking About Individual Needs

We focus on individual human needs and how they fit in with a social system that must be designed to survive in an alien environment.

The Australian social researcher Hugh Mackay wrote a book entitled *What Makes Us Tick?* which neatly identifies some core psychological drivers that make us what we are:

- the need for love and affection;
- the need to have a sense of place and belonging;
- the need to connect with others and to be taken seriously;

- something to believe in and live for, to improve and achieve, and so on.[2]



These are the essential emotional experiences of being human, and they cannot be ignored in favour of a cognitive model of humankind.

The KSI Assumption

Whenever the dream of permanent human settlement becomes reality, human beings will be able to transfer the complete package of individual wants and needs to community living in outer space. By necessity, for the sake of survival, there may well be a collective normative requirement for an extraordinary form of individual self-discipline. It is to be imagined how much the norms of social order will intrude on personal freedom. This is another open question.

What is clear is that whatever design emerges for living communities in the context of outer space, it will be a complex and adaptive social system comprising structures and functions that is likely to be more than we know through lived experience and call human society. Moreover, because of the special adaptive behaviour requirements (an elaborate kind of health and safety mindset), it is necessary to devise ways and means of accommodating our individual psyche, the complex bundle of moving parts we like to call wants and needs that drive behaviour and that give us individual identity. How can they be met in an environment far away from Earth and with no relationship with nature to provide existential comfort?

[2] Hugh Mackay, *What Makes Us Tick?* (Sydney: Hachette Australia, 2010).

Where to Start? As an important starting point for considering the inner life of living in outer space, without doubt, NASA and other national space exploration agencies will have examined in detail the psychological effects of being on space stations and all other extreme environments to test and appraise the limits of human endurance. Please examine the NASA website for access to such studies.

Taking the social system and individual human needs together, any living community in outer space must attend to how things will function in human terms. It is one thing to achieve technical mastery of outer space and quite another to create and maintain living communities in a context where everything that sustains human life is transported and embedded as a continuous life-support system. While that feat of technical mastery is being achieved and maintained, ordinary life should carry on, the countless everyday interactions and social relations that hold together, like a seamless web, our experience of living community. We invite you to explore these open-ended ideas and to give us your thinking. There are no right and wrong answers, but your ideas should pass the common-sense test of being plausible to reasoning minds.

Research Questions: Thinking Further About Human Society as Living Community in Outer Space

The KSI Vision

There is a long history of literary and science fiction imaginative writing about human beings living in the alien environment of outer space. We can all marvel at the scientific and technical mastery of spaceship travel and exploration, together with the disciplined team-based work of those living in space stations. We are reaching the stage of human accomplishment where it now seems feasible to consider the practical possibility of non-specialist living communities, ideally in sustainable and ordered permanent settlement in outer space. Driven by a passion to ensure that whatever form human society takes it is founded on shared values and core rules for living all can voluntarily embrace.

Undoubtedly, there is a long road ahead in perfecting the complex and technical aspects of building a sustainable infrastructure as a platform for human life for whole communities in outer space. That is not the primary focus of this learning program. Instead attention is concentrated on the *social aspects* of a complex technical system to support human life. We need to think about transferring what is presently known and understood about living communities on Earth and creating sustainable human settlement in the alien environment of outer space. This process may well entail revisiting the designs for living communities to assist their capability for adaptation for living in outer space.

Q1. How much change to what we know, value, and believe about living communities will be required?

While the technical mastery of that process is achieved, big questions arise about how such human communities should function; what we commonly refer to as a whole society.

More specifically, we need to pay extra attention to the role of education as a system, designed to produce a quality learning environment from early childhood through to continuing and lifelong provision into old age. More about these matters follows later.

As a general observation, the fictional social construction of human communities in outer space is hardly a recommendation for the kind of society most people would want to live in. As seen on TV and movie screens and read in science fiction, human society is typically run as authoritarian, military-style dictatorships, modelled on a dystopian society or like an imperial or feudal colony. Such images are most unattractive and nothing like the liberal social democracies many have lived in.

Q2. Is there anything of value to be learned from sci-fi literature that would help us to comprehend how humans should live, ideally as free-thinking citizens carrying forward what might be called the best of civilisation on Earth?
This is a different kind of New Frontier thinking, and imaginative thinking from literature sources may not be much help. This is for you to decide, based on what you have read and what has inspired you.

Q3. Is there anything of value to be learned from real-life experience that would help us?
At the same time there are real life examples of specialist and continuous communities, typically managed as impressive team-based organisations, to be found in the harsh environment of Antarctica and in working space stations. By they are just that, communities of highly trained and disciplined workers undertaking specialist tasks with fixed-term contracts to perform set roles and responsibilities. They are extraordinary communities, and they are certainly not the everyday ones we are all familiar with wherever we live on Earth.

Before engaging in further leaps of human imagination of an idealised society, we should pause to contemplate the reality of living community on Earth. Even a cursory reading of Yuval Noah Harari's latest book, *21 Lessons for the 21st Century* alerts us to the manifold challenges of human societies.[3] The book explores the big themes of technology disruption, environmental degradation, and extreme capitalism forcing human adaptability to constant and threatening changes that few are adequately prepared to embrace. The mass uncertainty that follows impacts everyone, notably in securing the core essentials of everyday life, such as having a decent work future and a healthy life balance. Moreover, growing disillusionment with the nature of the political process and governance has disrupted faith in finding *democratic solutions to the quest for social fairness and justice. Political populism fosters the myopia of inward-looking nationalism, and the spread of global terrorism creates an unease that these and other issues are barely manageable. As we are propelled forward, we collectively lack confidence in long-standing traditions and institutions to meet the challenge of change.* This dark and dismal scenario, the future the author claims we are in now, is hardly a secure foundation for contemplating, planning, and implementing a bold design for establishing living communities in the alien

[3] Yuval Noah Harari, *21 Lessons for the 21st Century* (London: Jonathan Cape, 2018).

environment of outer space. At least the writings of Harari and others on the threats to societies as we know them warn against being naïve and simplistic.

Q4. Maybe the extreme nature of the environment is the kind of collective challenge that humans need to construct an ideal-type society?
At the same time, the vision of KSI is of a future that may be both technically and socially realisable. The vision is one of hope and passionate belief that human beings have the capability to create and maintain new societies, even in the alien environment of outer space.

Assignments
Assignment 1: Your First Thinking and Writing Task
At this juncture, we pause from our musings and pay attention to yours. We invite you to trawl selectively through the *fictional* literature (commonly called sci-fi) on outer space exploration and human settlement, and to identify examples that you consider worthy of recognition for the quality of imagination and the elegance of writing. Travel back as far as you like, when science-fiction writing made an appearance and took hold of the popular imagination. Bring your reading into the present, and taking all that you have read (and seen), describe how human settlement in outer space, what we call society and living community, is imagined and created:

- What kind of society is depicted?
- Is it like what we know on Earth or something else?
- Could ordinary people live in such a society, without becoming like robots and having no individual identity?
- Explain what you have found, then compare it with the vision of KSI.
- Can we seriously learn from fictional imagination?
- Where is "reality" in the fictional literature?

Task: Write between 1,000 and 2,000 words summarising your findings and analysis. Ensure that you have cited the sources you drew upon to create your own interpretation. Please submit your assignment as a portfolio at the conclusion of the program. Regard everything you write as a work in progress.

If possible, share your thoughts as they take shape through your reading and thinking with fellow students. Remember, we are all on a journey of discovery.

Assignment 2: Investigating the "Serious" Scholarly Literature on Human Settlement in Outer Space.
This is a challenging academic task. You need to identify the *scholarly*, research-based and philosophical literature that has gone beyond science fiction to examine how humans live in alien environments:

- A useful starting point might be the communities from many nations that live for long periods of time in Antarctica. They must have deep and extensive experience of how such isolated communities live with each other.
- Going a step further, what is known about human life on space stations?

- What holds these specialised communities together?
- What can be learned from such actual experience and incorporated into your ideal-type model for living community in outer space?
- Has anyone, in the KSI network or beyond, written about the possibilities of human settlement in outer space?
- How plausible is their thinking and their designs for living?

Our advice in starting to explore this aspect of living communities in outer space is to search for authors who have paved the way with their own ideas, and who have taken the long journey into public scrutiny through publication. The KSI in-house *Journal of Space Philosophy* is an excellent starting point, for it expresses the core vision and values, and it seeks to apply them in meaningful ways and means. One author to take special note of is Yehezkel Dror, for he has left a trail of leading ideas that might well provide a foundation for your own explorations. There are bound to be others reaching out with their ideas that might ignite your own.

Task: *Write between 1,000 and 2,000 (or more) words summarising your findings and analysis. Ensure that you have cited the sources you drew upon to create your own interpretation. Please submit your assignment as a portfolio at the conclusion of the program. Regard everything you write as a work in progress.*

Again, if possible, share your thoughts as they take shape through your reading and thinking with fellow students. Remember, we are all on a journey of discovery.

Assignment 3. Thinking About Quality Education

Thinking about the social aspects of living communities in outer space leads to the special focus of this learning program, which is with leading ideas about QE. If communities are to live in outer space, there is surely an imperative need for a system of education and training to transfer knowledge and to develop special competencies to make everyday living possible. Moreover, as living in outer space will be regarded as a new learning experience, it is a challenge to design an education system that is a best practice model for human development. This is where QE makes an entrance into our thinking.

Before attending to QE as a concept, it is useful to be reminded of the key feature of formal education as an organised system. This usually means a whole society system, typically directed and controlled by government, and often incorporating private-sector institutions, in democratic societies for sure.

Use your imagination to create an educational system designed for living communities in outer space. It should start at birth and continue as a lifelong learning process, and it should be available to all regardless of social position in an imagined outer space community.

In the most general terms, the purpose of an educational system is to transfer knowledge and learned culture from one generation to the next and between all strata and groups of society (social classes, racial and ethnic groups, and so forth). The intention is that such a system of cultural transmission serves to integrate all kinds of people and subcultures into the recognisable form of a cohesive whole society unified under the banner of a nation state.

In the most general terms, the purpose of an educational system is to transfer knowledge and learned culture from one generation to the next and between all strata and groups of society (social classes, racial and ethnic groups, and so forth). The intention is that such a system of cultural transmission serves to integrate all kinds of people and subcultures into the recognisable form of a cohesive whole society unified under the banner of a nation state. All that the society knows, the accumulated knowledge and skills that enables it to function in economic, political, and many other ways, must be passed on and learned to maintain continuity and to adapt to a changing world. This process is not only about transferring selected and valued knowledge and skills, but also about socialising new generations into the values and normative order of society.

With increasingly complex economies, with high-order knowledge and skill requirements, the educational system must also devise ways and means of selecting by ability to supply capable human resources. Selection by merit often competes with other forms of self-selection by wealth and social advantage. Expressed another way, it is well known that there is not equal access and opportunity in educational systems, whether by social class, race and ethnic identity, or especially in poor countries and regions within rich ones. One safe assumption is that any living community in outer space must ensure that the competencies for survival and maintenance of a complex social-technical system are selected and developed through well-designed education and training.

Problematically, merit selection by ability is not an exact science, and it is often characterised by relative failure to identify and nurture the kinds of intelligence that schools and education generally are intended to foster. These matters truly worry educators and policy makers; hence, the emergence of QE to identify and address them.

The concept of QE is both aspirational and inspirational. It has emerged as one of the big ideas that international bodies like to embrace and promote as a universal strategy for improving all aspects of education as a system of provision for all ages. However, it is more than strategic thinking about access and equity to educational provision and a fair system of resource allocation. The idea of QE has clearly inspired educators to think about and design improved ways and means of making teaching and learning more effective, with outcomes that meet both societal and individual needs. We shall concentrate more attention on teaching and learning matters than on system improvement, as they reach to the core of our lived experience of education in our early years and beyond into adulthood and old age.

It is useful to highlight the leading ideas of QE as a prompt for your own thinking. These should be linked to what QE would mean in conceptual and practical terms within the special context of living communities in outer space. We continue our musings about this theme.

In the imagined context of living communities in outer space, both survival and adaptation are imperatives to ensure that all members of society learn to live in an alien environment. There is much to learn from the accumulated knowledge and skills of those who have lived on space stations and in isolated communities on Earth. This kind of learning must begin at birth and continue as a lifelong process. There is need for a system of lifelong education designed to ensure that everyone knows how to survive and possess the skills to adapt to everyday living, quite possibly under conditions of constant threat of disaster.

Q. The question to ask is whether educational systems on Earth are fit for purpose for such extreme conditions.

In such an environment learning must surely be concentrated on:

(1) functional knowledge for survival and adaptation;
(2) learning to live together under very challenging social and individual psychological conditions;
(3) acquiring and continuously supporting social attitudes and behaviour that poses no serious threat to the social order; and
(4) developing intellectual, creative, and other human talents that enable individuals to experience self-actualisation, that is, to be the best one is capable of being.

Any education system that can perform to such a high level of expectation is what quality means. It is a tall order, and most education systems on Earth fall short. It is better to assume that there is at least room for improvement, which is why QE is a useful cue to think afresh about what an ideal-type educational system should be like.

Concentrating attention not on a total system, but on the core activities of teaching and learning, whether in a traditional classroom, the workplace, or other settings where knowledge and skill transfer is undertaken, some leading thinkers have emerged to point the way forward. There are scores of ways and means of making teaching and learning effective, and there are many advocates. Those of us who have faced a group of learners, typically of mixed ability, motivation, and attention span, know how difficult it is to be an effective teacher or learning facilitator, to use a fashionable term in adult learning. Our choice is limited to one educator who articulates the aspirations of QE in the complex process of enabling the learning of others through a best practice approach to teaching. We refer to the work of Robert Marzano, especially his book *The New Art and Science of Teaching*.[4]

There will be countless numbers of good teachers who follow Marzano in setting goals for learners, give feedback, and assist students to deal with new knowledge and new learning experiences so that they develop a conceptual grasp and a sense of ownership,

[4] Robert Marzano, *The New Art and Science of Teaching* (Bloomington, IN: Solution Tree Press, 2019).

actively engage with students in the learning process, maintain good working relationships, and generally inspire them to aim high through hard work and application. It requires a high level of awareness by the teacher or facilitator to ensure that learning follows a developmental pathway, as it is easy to lose momentum and to stray off track. For both learners and their helpers, it is well known that gaining new knowledge is mostly hard work, but it is often inspired by the motivation to succeed. In that sense, Marzano reminds us that the conditions and process for good teaching and learning are accessible and manageable.

At this juncture, it is important that the educational system design incorporates an institutional framework that is based on and adequately supports the various expressions of QE. The emphasis should be on teaching and learning and the variety of forms it can take in the complex process of knowledge and skill transfer. The idea of QE should not be confined to what is often called the school age years, but it should begin earlier and continue as a system of lifelong education. There is nothing unreasonable about a comprehensive education and training system available and accessible to all, except for gaining traction politically and economically, as a universal human right.

We know of the long road ahead in establishing an ideal-type model of QE on Earth; therefore, the question arises, is it any more achievable in living communities in outer space? What spirit and form would QE take in such an extreme environment? These two open questions should be addressed in your third assignment.

Task: Write between 1,000 and 2,000 (or more) words summarising your thoughts. Ensure that you have cited the sources you drew upon to create your own interpretation. Please submit your assignment as a portfolio at the conclusion of the program. Regard everything you write as a work in progress. Share your ideas with fellow students as they take shape.

Summary

We have deliberately adopted a non-technical approach to what are open questions that any layperson might ask about the possibilities of creating moral and sustainable living communities in outer space. Our musings have also indulged some repetition, in a natural desire to emphasise the thought lines we consider important. Sorry.

We have assumed that sometime in the future, the dream of living communities in outer space will become an everyday reality. No doubt we shall marvel at the science and technical mastery that has created the dreams of science fiction writers and countless experts in a concerted multi-national endeavour. KSI has rightly identified the imperative to ensure that such a bold vision is framed by principles and practices that provide a moral and sustainable social order. This must be to enhance the immense technical requirements for survival in an alien environment, but also to prevent social chaos and disintegration through conflict and division. Moral principles and sustainable values exist for a purpose, and in outer space, there may be little room to deviate from a well-constructed social order.

To be a little more specific, your imagined order must surely address what rules for living should be made explicit and form a continuous awareness of the imperative for survival on terms and conditions that avoid destruction. This implies a social order based on consensus, but what kind of form should it take? Is it what many of us know as liberal democracy? That is, where the people have some say in who governs and how they are governed, or should it take a different form?

Without ignoring such broad-ranging questions of political philosophy, we must also attend to severely practical matters. A big issue of sustainable principle is how to manage waste. There will be scores of other sustainability type matters to be raised and resolved. Choose one or two, and then explain how they should be managed. Leaping to another level, how are humans to be sustained in a spiritual way? It is not essential to believe in God, but the effect of an absence of the comforts of nature and the wild on our spiritual lives must be considered a problem to be addressed. These and other matters underscore what we mean by an imagined social order and how things should work at all levels of human consciousness in a challenging and alien environment.

In your blueprint, we invited you to consider the important role of education and training, with special reference to how such a system would operate in an outer space community and environment. Just like our thinking about an ideal-type social order as well as an educational one, we are painfully aware of the shortcomings of the systems on Earth. This prompts the question whether in creating living communities in outer space it is necessary to think afresh and to produce a completely different social and educational order, not a copy of the Earthly ones?

Into such a complex setting, we invite you to think about the nature of such a social and educational order and to provide your own interpretive blueprint. Freely use your creative imagination, but also connect with those who have also thought about these matters, and engage in a discourse with their writings.

That is what we are asking you to do in the three linked assignments, which should give expression to your thinking and provide an annotated bibliography of the works of other authors you found useful. Consider yourselves pioneers in the KSI learning community, for others may well seek to learn from you.

****

Editors' Notes: We want readers to be aware of the education originality of this essay by Drs. Barry Elsey and Amina Omarova. Dr. Elsey is the Dean of the Kepler Space Institute (KSI) Education Department. They are both faculty members within that department. They have taken the lead on the challenge of creating the theory and designing the graduate curricula for humanity's unprecedented evolution to the settlement of communities and societies in Space. All the reality of those human settlements remains in the future. We know it will happen. We also know that how it happens will be the critically important success variable for the future improvement, and survival, of humanity.

KSI has included that challenge in its academic vision for its future courses, programs, and degrees. The KSI leadership invites readers to read the academic catalog on our website (www.keplerspaceinstitute.com) and to consider the portions of it relevant to their own educational goals. ***Bob Krone and Gordon Arthur*.**