The FOA Audio Series: Volume 19 with Dr. Stephen Rudin and Matthew Kelly

Skills for Success in the Fourth Industrial Revolution

21st Century Perspectives from the 2016 Davos Forum and the Neurocognitive Sciences
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He is the Founder and Principal Mentor of Individual U, Peak Year Inc., and The New Heights Center on the Shawangunk Ridge. All three organizations engage neuroplastic change to help students, families, business executives and organizations develop more elegant neural wiring for their best and most joyful paths forward.

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A member of the Princeton Council on Family Offices and the NYU Stern Family Office Council, Mr. Robles has a long record of leadership positions at top financial-service companies, including UBS. Before launching FOA, he founded and ran several successful entrepreneurial ventures: He served as President of the New England chapter of the Hedge Fund Association, and pioneered online retirement planning for Fortune 1000 executives with two Internet startups - 401KRollover.com and IRARollovers.com.

Author of several books and articles, Mr. Robles has appeared on Bloomberg Television and Radio, and has been quoted in the Wall Street Journal, Thompson Reuters, Institutional Investor, Opalesque, Registered Rep, HFM Week, Investment News, EurekaHedge, The Luxury Institute, Private Asset Management, The Greenwich Times and many other media outlets.
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FOA is the community leader in serving all the key imperatives for ultra-high net worth families, respecting your privacy but enabling an intimate community of global families like yours. Our organization delivers private education and networking opportunities, proprietary research, and access to salient thought leadership that will interest all generations of your family.

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Angelo Robles: Welcome everyone. This is Angelo Robles of Family Office Association. In today’s FOA audio podcast, Skills for Success in the Fourth Industrial Revolution: 21st Century Perspectives from the 2016 Davos Forum and the Neurocognitive Sciences, I would like to introduce writer, MD, educator, and creative innovator, Dr. Stephen Rudin, the Founder of Individual U, which is arguably the world’s leading collaborative mentoring organization. Dr. Rudin is also the Founder and President of Peak Year and IU New Heights.

With Dr. Rudin today – I cannot quite call him Dr. Kelly yet – he is just now completing his dual PhD; but Matthew Kelly, scientist, historian, author, and co-principal mentor and Executive Vice President of Individual U, and Co-Founder of Peak Year. As I hope you all are followers of our podcasts, you have heard them speak before about how to raise happy and effective learners to become responsible and successful adults and stewards. If you attended FOA Miami, they spoke with us there about the skills for success our schools and colleges don’t impart to our children and young adults, which of course, is very important. A very important investment related topic that Stephen and Matt have been developing, and which we will hear about at our upcoming FOA Greenwich, is that the best return on investment a family or a family office can get comes from investing in their own intellectual, social, and emotional capital, mindfulness, creativity, and innovation, particularly in times of change and challenge. We are looking forward to hearing that.

As I noted, today’s topic is strongly related, and comes on the heels of the recent Davos Economic Forum: Skills For Success In The Fourth Industrial Revolution, 21st Century Perspectives from the 2016 Davos Forum and Neurocognitive Sciences. Gentlemen, how are you?

Matthew Kelly: I am doing quite well, thank you.

Dr Stephen Rudin: It is a pleasure to be here this morning, Angelo.

Angelo: Thank you. Let us get right to it, Stephen and Matt. Now clearly, that is a very packed title. Let us begin by unpacking it for the audience. A place I would like to begin is what is the Fourth Industrial Revolution and how did that terminology come about?

Stephen: Angelo, I’ll take that. I am going to answer it first with an historical perspective. There have actually been four Industrial Revolutions. I like the way that they are described by Klaus Schwab, who was the Founder and the Executive Chairman of the
World Economic Forum, and will borrow from his explanation.

He looks at the First Industrial Revolution as the use of water and steam to mechanize production, going back to the late 1700s and the steam engine up through the late 1800s. That was the First Industrial Revolution. The Second Industrial Revolution used electrical power to actually create mass production, which is how engines entered industry, not just travel.

The Third Industrial Revolution, which we can actually remember in our lifetimes, was the use of electronics and digital information to automate production. Going back to the 1960s, you can see the beginning of the Third Industrial Revolution, which continued and evolved from there. I should mention here that when we talk about the shortcomings of our current educational system later on this morning, the model for university professors who are teaching today came from training to educate students for the Second Industrial Revolution. So our whole higher educational system is based on a professorial didactic model and type of thinking that is in many ways long past its day.

As noted in the recent World Economic Forum, the Fourth Industrial Revolution had now begun. We don’t know how it will end up or all that it will be, but we can summarize its character at the beginning. The Fourth Industrial Revolution, or I4 as some people prefer to call it, is a revolution where we see a fusion of technologies, a blurring between the physical world, the digital world, and biological spheres.

Another way people define the Fourth Industrial Revolution is to think of it as being about the Internet of Things, an Internet in which it is possible to add digital codes or connections to things around the world – then connect these things, and have as the coordinator of all of it a type of technology that connects the physical, mechanical and cyber world, a cyber physical system or CPS.

Matt, why don’t you talk about the drivers – the socioeconomic drivers and the technological drivers – that brought us here?

Matthew: Absolutely. As Stephen mentioned, each Industrial Revolution is marked by a change of some kind. Many scholars are interested in the so-called Fourth Industrial
Revolution because in it, even more so than in the Industrial Revolutions that came earlier, change is changing more quickly. Or, said another way, the rate of change in our world is accelerating. It might sound strange, but we can see it happening. Many of us have a visceral sense that the ordering of our world is shifting at a rapid pace. We are experiencing significant changes in how we connect with our world and with one another, and are therefore developing new ways of thinking about things.

The World Economic Forum’s recent Future of Jobs Report actually tried to wrap its mind a little bit around this transformation. It surveyed a great number of leading global employers to better understand the changes that are transforming our workplaces and our workforce. As Stephen mentioned, the Report outlines two main categories: socioeconomic drivers of change and technological drivers of change.

The top five socioeconomic drivers of change are quite interesting:

First, there are phenomenal shifts and changes in our work environments, and consequently in the relationships we see between workers. The work world today is fundamentally different than the work world of 25 years ago. People are working across greater distances, with globalization bringing people together physically and digitally.

Second, there is a rise of the middle class in the emerging markets of the world, which is correspondingly increasing the degree of cross-cultural interaction and cross-pollination of industries.

Third, we see significant change in terms of climate and national resources, which of course are interconnected. These changes exert direct and indirect influence on business practice, as business leaders and entrepreneurs reexamine what is considered successful, what is considered healthy, and most importantly, what is considered sustainable.

Fourth, there is rising geopolitical volatility, which we can see across the board in terms of the mass relocation of people.

The five socioeconomic drivers of change are: 1) changes in our work environment; 2) the rise of the middle class in emerging markets; 3) changes in national resources; 4) rising geopolitical volatility; and 5) reconceptualization of privacy.
And finally, there is a reconceptualization surrounding the notions of privacy, which we see in the news all the time.

These changes, from a socioeconomic perspective, are believed to play a huge part in the rapid transformation and revolution within our workforce. In terms of technological drivers of change, there are again a number of phenomenal developments in genetics, artificial intelligence, robotics, nanotechnology, and biotechnology, which appear poised to transform our world in major ways. In addition, the Report lists the top five technological advances already seen as driving change in the workforce:

First on the list is the development of mobile Internet and cloud technologies that transform the way businesses operate, and the way data is shared, stored, transferred, conceived and defined.

Second, there are advances in computing power and big data, wherein we have a tremendous flow of data and are able to create metrics for nearly every aspect of life.

Third, there is the rise of the so-called Internet of Things, which allows us to glean data from our day-to-day lives that is truly astonishing – and overwhelming. While it presents the possibility for identifying and mapping patterns in our behaviors, interests, desires, etc., we must develop the capacity to process the data.

Fourth, we witness tremendous change in the global energy supply and the rise of renewable energy industries, linked of course to concerns with global climate instability.

And finally, we see the rise of technologies allowing peer-to-peer crowdsourcing, which permit individuals and small groups to play an increasingly large role in the global marketplace. And at the same time, for business leaders who become versed in these technologies, they offer opportunities for expanding a business’ exposure to an ever-expanding pool of global talent.

As I mentioned, in order to succeed in this Industrial Revolution, we must begin to wrap
our minds around these drivers of change and think innovatively about them.

**Stephen:** As Matt and I have been considering the type of innovative thinking that is necessary to look at the world anew, we thought of Einstein’s statement that you cannot solve today’s problems with the kind of thinking that was present at the time they were created, and too of the advertising terminology “to think out of the box.” But the box seems no longer relevant in this Fourth Industrial Revolution, so a term that we coined is “thinking beyond the box,” to represent that we have left the thinking of the past and need to move to a type of thinking that transcends the moment that we are in. That allows us to look at ourselves internally, at our own thinking processes and wiring. So that our thinking anticipates a vast amount of upcoming change. Just being creative in the moment in response to a challenge is still necessary but no longer sufficient.

Angelo, there are probably more specifics that you might like to know about this. What would you like to know for your audiences?

**Angelo:** Yes, given that we are an audience of family offices and businesses, maybe you can be a bit more specific about how the Fourth Industrial Revolution will affect the business, family businesses, and the world in general?

**Stephen:** Great, well let us talk about it first in terms of inclusiveness of all of those groups. We are talking about a type of change from this Fourth Industrial Revolution that is unlike anything that humankind has ever experienced before. As I said, we do not know how it will evolve. But the first thing to say about how it will affect all of those is that they are all stakeholders. It is going to have to be integrated in some kind of comprehensive way for all sectors of business and all societies. Every contributor from each one of those groups, office, family offices, and families will have to think about how they will interact.

That leads me back to the most important thing that all of the groups, all of your stakeholders, will have to do. In order to respond to this extreme level of potential and change, everybody is going to have to have a new and much more flexible set of skills and neurocognitive capacities. When we go through the list of skills that came out of Davos, which we will do a bit later, we will see that what underlies them is a need for creative thinking, to see connections between seemingly unrelated facts and familiar things in new ways.

I think that the first thing that is going to affect everybody is that preparation will not be
defined as the ability to classically train their minds for a new, specific job, as is done in a business training program to learn to do a new task. But instead, across the board from our children to young adults, the current heads of companies to the future heads of companies, preparation will be the ability to acquire the underlying neurocognitive wiring to be able to manifest the skill set that came out of the Davos conference. The challenge is to align ourselves with the opportunity. It is a huge kind of leaning challenge that will affect everybody at every age.

Matthew: What I would add is that when people really try to set their minds to talking about this Fourth Industrial Revolution, typically they embrace one of two extreme perspectives. One perspective is that this revolution is going to bring about limitless possibilities for people to prosper, to connect, and to engage in ways they never have before. On the other hand, we hear discussions of how these changes are going to bring about a massive dislocation of jobs.

One of the most important conclusions to come out of the Future of Jobs Report, and out of neurocognitive research more generally, is that both the current and rising generations of leaders and stewards must develop capacities to respond to and take advantage of these processes of change – to turn challenge into potential.

Both the current and rising generations of leaders and stewards must develop capacities to respond to and take advantage of these processes of change – to turn challenge into potential. According to some estimates, 65 percent of children entering primary school today will ultimately end up working in completely new job types that do not exist today. That is a phenomenal projection. We need to teach ourselves and the future generation not only how to live through change, but how to think flexibly and creatively in a rapidly changing world. We must teach them, in short, to thrive in it.

Stephen: Matt, to your point, we have already begun to see this in technologies that were developed with great enthusiasm for the opportunities that they could bring for communication, for understanding, and for education. If we go back to the early 1990s when Adam Engst wrote the Internet Starter Kit book and I wrote the Internet Starter Kit CD-ROM, I did not anticipate any kind of real commerce on the Internet. We thought of it as a social community. We certainly did...
not anticipate that it would be used for the planning of revolutions or lead to any kind of disruption to societal norms. It was just a technology of communication.

If you look at what is happening in the Fourth Industrial Revolution, the technology gets multiplied enormously. Emerging technological breakthroughs in artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, and nanotechnology make possible for somebody who is thinking about something on one side of the world to physically create it on the other side of the world, for all kinds of use, for good, and potentially for great harm.

How we look at these technologies as businesses and as family offices will be critical – the old technologies will stop working, so businesses that cannot interact with these changes in technology will be in limbo or worse. Correspondingly, our ability to develop cognitive capabilities that are not only about how we build things or how we solve things, but that anticipate the outcomes of what we are doing and help us to choose wisely are very important. Everybody will be forced to interact with these technologies. One place that we need to think about that is in family business in terms of what it will do to our employees and entire structure.

The kind of change we will see in the Fourth Industrial Revolution will tend to sort people into a bimorphic population. The people who have the skills, the intellect, and the ability to interact with it, and be relevant with it, will do better socioeconomically. They also will have access to technology that will make their lives easier, that will make commerce items cheaper, make their lives healthier, etc.

On the other hand, the discontent of the population that cannot keep up with the skills, that is not teched up, will be several quantum leaps greater. Because people will truly feel that there is nothing for them anymore. Fueled by social media, and thirty percent of the world uses social media, a sense that the world is so unfair, that it is a winner take all economy, can possibly lead to the kind of uncontrollable unrest that nobody would want to see anyplace.

One of the most helpful things we can think about as family offices and family businesses is the way that we each act with social
responsibility. We have talked before about how families impart social responsibility to their children and future leaders – about teaching them to not have a selfish attitude, but rather a do good / do well mentality, where they consider the global impact of their actions. If we all act with responsibility instead of fueling mass discontent, we may control the opportunities within our own companies. Then across the country, we will have a situation in which this is beneficial to everybody. I think that is a really important ethical and moral consideration of this kind of technology.

I think Angelo, we had promised you the opportunity to ask some questions. You, and I, and Matt have had some private conversation. Do you want to take it from here and kind of take up any of the conversations that we had as a precursor to this?

Angelo: Yes, I think that transitions well. We have had, the three of us, several conversations. We have talked about a detailed report of the Future of Jobs that came out of the World Economic Forum. Embedded in that report, I understand there is a list of the top ten skills or requisites for success in 2020. Can you elaborate on that list? In what ways might it be different from the list of skills thought to be important in the present?

Stephen: Absolutely.

Matthew: Stephen, why don’t I discuss the 2020 list? Then you can explain some of the important differences between that list and the 2015 list.

Stephen: Great, thank you, Matt.

Matthew: The Future of Jobs Report we mentioned previously is a fascinating document. In many ways, it captures a core set of beliefs regarding how the world is going to change, and the skills that will be necessary to meet that new world. Many of the skills that it elaborates are skills that neurocognitive researchers have championed for some time. But the Report, I think, captures them and crystallized them very well.

According to the Report’s predictions, to succeed in 2020, individuals will have to demonstrate the capacity to:

1. Engage in complex problem solving
2. Think critically about the world
3. Exhibit creativity and innovation in approaching problems
4. Manage disparate groups of people from across wide geographic distribution
5. Coordinate with others and work as a member of a team
6. Exhibit emotional intelligence, which is the ability to understand what other people are thinking, and to place oneself in their
perspective. Closely related to this is what some professionals refer to as cultural intelligence, which is the ability to respect and understand other cultural values and practices.

7. Practice sound judgment and decision making,
8. Cultivate a service orientation with people from across a diverse socioeconomic and geographic spectrum
9. Negotiate collaboratively
10. Manifest cognitive flexibility, which entails shifting and changing the way one approaches questions and problems depending upon circumstances.

Stephen: These skills are stated in a business sense, Matt, yes?

Matthew: Yes.

Stephen: Later on this process, we will take a few minutes to look at the neurocognitive wiring that underlies these skills, and the activities and practices necessary to acquire them. But first let’s return to Angelo’s question, meaning how does this 2020 list differ from the list from five years ago, or ten years ago? I think that the economic forum had a list of skills for 2015. What you see, if you look between skills for 2015 and 2020, is not so much that the skills changed but that they have shifted in priority.

We could see the onset of the Fourth Industrial Revolution coming at a distance. Many of our most interesting science fiction writers and futurists had predicted its coming and have debated its importance, its dangers, and benefits. So it is unsurprising that the skills to navigate it could be predicted as well, and began to emerge in importance before we could fully comprehend this revolution.

Two of the skills you see on the 2020 for the first time are emotional intelligence and cognitive flexibility, showing just how important it will be to have a different kind of thinking capability, not just a didactic service skill-related training. We are already talking about developing skills on the list to be able to keep up and learn.

Complex problem solving was at the top of both of these lists. I always like to give the example of the P versus NP problem. If you are not familiar with it, it basically underlies the whole question of how we have nuclear security and banking security. Both types of security are built on incredibly complex types of mathematical reasoning – that is, whether or not there are things that cannot be solved in a lifetime by computers no matter how fast they are. That would be called nonpolynomial (or NP) time, whereas things that can be solved within a lifetime are called polynominal (or P) time. The mathematical question, does
P=NP, has as an implication that if there is no difference between polynomial time and nonpolynomial time, and all problems can eventually be solved, security codes can all be cracked if we work fast enough. The incredibly complex problem has been worked on by Michael Sipser at MIT. If P=NP, all of our assumptions about some of the most basic safeguards, security, including financial security, cybersecurity, and nuclear security, will have to change. They would go out the window and just be subject to these more and more complex computers’ ability to problem solve.

Trying to solve those kind of security problems now as we become more dependent on technology is critically important. So critical thinking makes it to the top of the list. It was there before. It stays on top of the list.

Number two in 2015 was coordinating with others. In 2020, it is displaced by critical thinking. Then on the 2020 list, creativity, which is something that was all of the way in the bottom of the list of 2015, we now see as number three. We see creativity moving way up and going back to the idea that without creativity and innovation in the time of change and challenge, we will not be able to solve our problems. We tend to think of “XQ,” – the mysterious X being contrasted with the I in IQ or the E in EQ – as the ability to be creative and innovate in times of change and challenge.

There is nothing on the list from 2015 that is not important. As I said, other things just moved up. People management remains important. None of these things are possible if you do not listen carefully and work proactively. You cannot let things go by you and survive in such a quick moving world.

The main thing here is that what has changed is a moving up on the list of our thinking process and our ability to be flexible in our minds. We see the emergence in the list of neurocognitive capacities that underlie the types of skills we need to thrive in this Fourth Industrial Revolution.

I think having looked at the list, would you like to know more about neurocognitive science that underlies it? Would that be helpful for your
audience, Angelo?

**Angelo:** You must be reading my mind, Stephen. Let us take it from there. In continuing to unpack the title of our talk, you mentioned the news from the world of neurocognitive science. What is that information in terms of skills from the 21st Century and of course, the Fourth Industrial Revolution? Why is it so important? Who was it for?

**Stephen:** Okay. Well, we couldn’t pick a better week to talk about it. The Cognitive Neuroscientists Annual Meeting is going on in New York right now. We spent some time talking with the person who we admire and speak with the most about this issue, Dr. Adele Diamond, one of the real luminaries in understanding how neurocognitive science can impact individuals through activities you do to build your capabilities.

Let’s begin, as I said, by thinking about the popular metaphor of “thinking out of the box,” which we consider passé. The metaphor that people may want to use, the one that we have coined is “thinking beyond the box.” I think we will come to see that as a hallmark of where we are. Both the box itself and the thinking that we did to get outside of it have become irrelevant. We need to not only think outside of our previous mindset, but to think in entirely new ways for a world that will be defined by a whole new interaction of time, space, with human, cyber, and digital technologies that represents a whole different kind of thinking capability and not just the creativity to think outside of how we used to think.

Neurocognitive scientists have been thinking about the abilities and skills that would be needed for success in the 21st Century. It is the neurocognitive experts who can best explain on a level of learning capability what the skills are.

The first one from their standpoint would be self-control, having the self-control to resist temptation and act impulsively. The faster anything moves, the more imperative it is that you not have a knee-jerk and inappropriate reaction to it. If you are traveling down a highway at a tremendous speed, and you jerk the wheel, you are out of control. You need to be calm enough to make the right decision. You can multiply that metaphor a thousand fold in terms of the kind of multidimensional accelerations that we are going through now. Self-control capabilities are vital. That includes being able to wait to make up your mind. Not jumping to a conclusion or prejudging.

I think this has become an issue in our recent political debate. Are people answering and saying things impulsively in response to
challenge or the news without thinking through what it really means in the long-term for themselves, for their campaigns, and for their country? I think we are all mourning a loss of self-control. But it is going to be a critical thing for leaders of family businesses and not just for leaders of countries. Leaders of family businesses and members of families that want to act cohesively and collaboratively will have to exhibit enough self-control to listen to each other, to wait, and to understand.

Going along with that would be the idea of discipline and perseverance. Or as Angela Duckworth likes to say, “grit,” having the discipline to stay the course and complete something. When there is a tremendous amount of change, where individuals, small businesses and large businesses need to undergo a great deal of trial and error in getting it right, there is a huge temptation to become frustrated. If the work is too hard or too complex, it can turn out the way as you might have done in calculus class if you were a poor math student – you might simply turn to something simpler that is more fun in an attempt to ignore the challenge at hand.

We have learned, in every phase of life, simply ignoring a problem as if it just does not exist only complicates it and exacerbates it. You need to be able to persevere, be on focus, and not be tempted and pulled away by things that are distracting you from the task at hand. It may be a long time until the reward comes, whether it is peace in a nation or apology between nations, or re-architecting an educational system, or re-machining a business to be able to interact with the Fourth Industrial Revolution. It may take a while. Profits may fall. There may be a period of confusion. But we need the grit to make it through.

Leadership is about being able to seek freely whatever is available to rally the forces, to rally a family to act cohesively, and to know that you will get through the challenge and be the better for it. Not just avoid internecine warfare. It is a very important set of skills that cannot be learned in a week in a PowerPoint lecture. It is a set of skills that develop over time through a specific type of experiential learning.

Another thing that will be needed is creativity. Maybe the thing that will be needed most now is creativity in seeing connections between...
what seems unconnected. We have never had a situation in which we had to connect what was biological with what was digital, and what is being manufactured now did not exist in the world before. This “Cyber-Physical Connectivity,” for example, has never existed.

Underlying that, you need what is called working memory. The ability to hold many variables in your head long enough to see what the connections are. Again, this requires a type of neurocognitive ability that we do not necessarily get from every day school or every day activity.

Another type of creativity that is predicted to be very important by cognitive scientists is in seeing familiar things in a new perspective. We can think about it in terms of looking at a picture – you might look at it the same way day after day, and then one day see it completely differently. You might see something beautiful and that you never noticed before. This is a complicated and rich variation of creativity: letting yourself look at something in a way that you’ve never looked it at before so that suddenly it appears to you as a solution, or a potential, or a connection.

Consider the first people that saw the idea of folding as a solution to how to travel across space. Can you imagine the creativity that was involved in saying if we cannot go fast enough to go to one end of the space to the other, maybe space can fold on itself? If you imagine space as a rectangle, if two of the corners were right next to each other, you would not have to go very far. It is the whole idea of suddenly using origami and folding as a way to think about possible solutions to complex problems in traveling through space, or in working with a decreasing amount of available land, or the limited drinking water on the planet. It all comes from a creative solution of applying something from one area or realm to another. Like taking Japanese folding and suddenly looking at it to try to solve biological problems, physics problems, and space problems. That was tremendous thinking. As I say, not out of the box thinking but thinking beyond the box and leaving the box behind; and completely harnessing a set of creative abilities that did not exist before. That nobody needed to have before.

Creativity is related to cognitive flexibility. Even in a creative mode, if you can only see things one way and not navigate around the obstacles to your own creative solution, you will find yourself in a corner unable to move. The ability to navigate around obstacles and to be able to admit you are wrong and move someplace, to withdraw and try something else, is critically important. Tai Chi is thousands of years old – it teaches you that when one of your attempts to deal with
a circumstance that has confronted you does not work, you step back, and move in another direction. You do not just move linearly. You move in three dimensions with flexibly to get around the problem. It is a metaphor for the kind of creative flexibility that we have to develop.

Angelo, when you and I had talked privately about all of these capabilities you asked me if there was some sort of a shorthand for them. There is – Executive Function. I think Adele Diamond was the first to say we could think of Executive Function as a shorthand for all of the abilities that we need to navigate life, relationships, marriage, job, work, and preparation for the Fourth Industrial Revolution.

Matt is an expert on Executive Function mentoring. Maybe he can break down what they are in a way that the audience will appreciate.

Matthew: Absolutely. As I noted, the listings of skills enumerated at Davos, and that appear in the Future of Jobs Report, confirm what neurocognitive scientists have been saying for quite some time. The shorthand neurocognitive scientists use to discuss many of these skills is “Executive Functions.” I like to think of Executive Functions as an overall skill subset that includes the top ten capacities listed by Davos, while also “filling in the gaps” between them.

Dr. Adele Diamond, who Stephen mentioned, likes to break Executive Functions down into core Executive Functions and higher order executive functions. When you hear the names of the different Executive Functions, you will recognize a great deal of overlap between the terminology Dr. Diamond uses and some of the language coming out of Davos. There are three core executive functions:

1. Inhibitory control, which is the ability to exhibit self-control, discipline, and selective attention. When you are in a situation of great change and flux, you require inhibitory control to manage your emotions, remain focused and get the job done.

2. Working memory, which we sometimes erroneously reduce to holding information in our minds. In reality, it is far more robust, and includes the ability to not just hold information but manipulate it, change it, and view it from different perspectives. This skill is going to be critically important due to the great influx of data we’re generating as a result of the fusion of different forms of technology and knowledge generation.

3. Cognitive flexibility, the same term that appears verbatim in the Future of Jobs Report.
In terms of the higher order executive functions, we have problem solving, reasoning, and planning. Again, we can see the synergy and the overlap – in some cases direct and in others indirect – between these skills and the skills the Future of Jobs Report identifies as critical for success in the 21st Century.

**Stephen:** Angelo, I know that you asked me to make sure that in our discussing these skills that we didn’t leave the audience without an introduction to what can be done to educate ourselves, our children, and our future stewards. Strategies for people who are struggling with recent technologies let alone with the Internet of Things and the cyber-physical technologies to come. Would you like us to use as part of the podcast maybe to explore that?

**Angelo:** Yes, you must again, Stephen, be reading my mind. What kind of mentoring, teaching, coaching exists to have people acquire these skills?

**Stephen:** Let me begin with an anecdote. Way back, when I was a first year medical student – about the same time that Abraham Lincoln was president – I was in a lecture, seated next a young female fellow student. While I was busy taking notes, she was knitting, which I thought that was pretty interesting, so I asked her about it. She replied that she was listening for what seemed to be the key things to go home and study, and that there was no point in writing down everything that someone says, as it takes away from one’s ability to filter the information. But she was also knitting because she planned to be a surgeon, and would not be able to entirely learn that skill on the day she went into her surgical residency. But she believed that if she practiced her knitting then, with both her hands, and with her eyes closed, she would be brilliant in the Operating Room.

She was a great role model. Nearly all of the women in my medical school class ended up knitting. Then the men started knitting too. It is a metaphor that I have remembered and applied throughout life. Preparing a skill set years in advance.

The point here being that the first group of people we need to think about in terms of preparing everybody for this Fourth Industrial Revolution, even if years in advance, is our children.
the learning we offer to all of our young children – we must consider the type of thinking and self-control that you can develop from early on, the social and emotional intelligence, the ability to read and understand the thinking of other people.

And as Matt said, the ability not only is to hold things in your mind but also to manipulate them. All of these executive function-based abilities are critical. The good news is that if you start with children early enough, executive function in young children can be improved by brief, simple and enjoyable activities like teaching them piano and sitting with proper posture for a few minutes a day over a period of years, even if sporadically. It will set up pathways for better executive behavior. Another simple, beneficial activity for promoting executive function capability is practicing drumming rudiments, especially if they are incorporated into the school day when you drum as a group and hand off little riffs between people, then work in small groups to collaborate.

Collaboration is one of the key skills among young people to be able to succeed in the Fourth Industrial Revolution. We can help to develop [these] skills if we just set up play-like activities.

There are activities we can teach to children that help decrease impulsivity and increase the ability to act logically and peacefully at an earlier chronological age. If you do the appropriate studies, you can see the areas of the brain that inspire impulsivity shrinking in children who participate in these activities. You can see the areas for logic and rational reasoning growing. It has been shown scientifically that there is potential to foster these skills. We need a lot more research about this. We need funding for future research on how best to get these skills to children. Again, I am mentioning one last time, Dr. Adele Diamond. We would love to see all of her work funded to determine scientifically which activities are the most beneficial in helping young students develop executive function.
In families and in family offices where there are the means to do this, encouraging the schools that your children attend to incorporate these skills is vital. Or seeking out people who have the expertise to impart this skill set to children outside of their traditional schools is critical. In our own programs, Individual U, and Peak Year, we work with perhaps 30 to 50 children, young adults and families over the course of a year. We mentor them in activities to build executive function skills, including tango, origami, drumming, circus, as well as wisdom path practices like mindfulness and yoga for understanding the freedom within restriction, and other activities to develop emotional intelligence, creativity, collaboration and grit. We teach Tai Chi, and Aikido, and other forms of what could be seen as martial arts. But we mentor them as a way of two people engaging, not attacking each other, and finding a way to kind to join their opposing forces, bringing the energy together and coming to a collaborative solution for difficult problems.

With so much change and challenge going on in the Fourth Industrial Revolution and in the world of the 21st Century, it’s very important that family business members develop the shared emotional intelligence to act creatively, collaboratively and cohesively and to avoid internecine family warfare and litigation. In these kind of times, you want your family to act as a functional syncytium, maintaining their individuality but giving up their individual beat and instead having the ability to coordinate and collaborate at a time of difficulty, making decisions that support the family and the family business. That is an intelligence and skill that you can acquire through mentoring and practice, that a family or family business in its entirety can acquire. It's a skill that someone who is going to become a family steward certainly needs to have. Matt, could you take a minute to talk about experiential learning?

Matthew: I'd be happy to. Briefly, didactic learning is the type of learning that we are most familiar with – it generally comes to mind when one is asked to remember their schooling. It is oftentimes classroom-based, or lecture-based, and is generally rote. We may contrast it with experiential learning, which entails a more mindful integration of the past, present, and future. Experiential learning, which is more hands-on, strengthens flexible thinking and thinking within the context of change.

While I have briefly mapped out two different types of learning, I think one very important thing to note – and which dovetails off of what Stephen has discussed – is that preparing children and young adults for the Fourth Industrial Revolution is not a single-solution
problem. We really have to develop the capacity to engage both didactic and experiential learning.

I will give two very quick examples to underscore the pitfalls of limiting ourselves to only didactic or experiential learning. Executive function coaching is something that we oftentimes hear discussed as a strategy for helping individuals who struggle with organization and planning. This type of coaching is typically didactic. You sit down with a coach, who has a planner, walks you through your day, helps you organize your week, etc. The approach is not typically sufficient for developing cognitive flexibility and the other executive functions. How many parents have bought their children planners, only for them to sit untouched in their children’s bag?

On the same token, let’s consider skills such as emotional and cultural intelligence. Experiential learning is, of course, very important for that. However, if we hope to help young adults develop core cognitive flexibility and cultural intelligence skills, we cannot simply air drop them into a different country to have them, for example, backpack through the countryside as part of a gap year. Again, developing cultural intelligence is not a single-solution problem – it requires the development of an interface between didactic and experiential learning that is itself innovative.

Angelo: Gentlemen, in the two minutes that we have remaining – and this has been an incredibly interesting and thoughtful dialogue. I very much look forward to building upon this at various FOA programs. Maybe give my audience a final thought on this intriguing and important subject. What would you like to leave us with?

Stephen: Matt, let me say two things, maybe you would like to say two as well.

The first is a reminder of the wisdom that you are only as happy as your unhappiest child. We will have very unhappy children if we do not prepare them for a world that is changing faster than we ourselves can change. We need to really rethink the whole paradigm of what we do to educate children.

You are only as happy as your unhappiest child. We will have very unhappy children if we do not prepare them for a world that is changing faster than we ourselves can change. We need to really rethink the whole paradigm of what we do to educate children. A lot can happen at home.
We are more capable of quickly making change within our homes, families and our family offices than we are the entire larger school system out there.

The second is also a reminder that you want to prepare children for life, not life for children. There is no way to alter all of this so that it fits your child. You need to prepare your child for what comes ahead. By children, I mean anyone between age 1 and 27, 28, or 30, when they are still finishing up their schooling and getting ready to be trained to lead a company. It is essential that the skills be taught, and not that we try to just pave the path. Matthew, why don’t you have the last word?

Matthew: The only thing that I would add is that in order to help prepare our children, our young adults, and ourselves to think more flexibly, creatively, and innovatively about our world, we have to think more flexibly, creatively, and innovatively about their education and the ways in which we prepare them for the future. As we have begun to discuss here today, people working in multiple disciplines are making important contributions to this ongoing discussion. If we as parents, heads of family offices, executives and entrepreneurs demonstrate the requisite cognitive flexibility in thinking about how we teach our rising generation of leaders, we will better prepare ourselves for the changes that are inevitably coming.

Stephen: We will just end by saying that we are kind of a visiting fixture at a lot of FOA meetings, whether we’re speaking or visiting, and enjoying seeing our friends. Anybody at FOA can curbside us at any time to ask us questions about anything. We are happy to speak with anyone in FOA regarding anything related to their families, children or business.

Angelo: Stephen, for those listening in; and this is perhaps new to them. Or, they have not bumped into you before. They want to be more proactive and reach out. What would be the best way they could reach you?

Stephen: I think the best way to get all surgeons is to call them directly. I would like to say I’m still pretty much on call 24/7. You probably have distributed my cell phone and Matt Kelly’s. I can be reached at 917-575-9662 pretty much around the world any time of the day. I can be reached at my e-mail, srudinmd@gmail.com, or through Individual U’s main learning office which is in New York City at 212-721-2607. We are very informal, particularly with our fellow colleagues and friends at FOA. You can drop us an e-mail or call us.

We considered it our pleasure to be an asset to FOA members to discuss learning, education,
executive function, or any of the topics we discussed today. If there is more involved, we also can invite you in for a consult to talk in greater detail. But anytime, feel free to give Matthew Kelly or myself a call. Matt, do you want to give the audience your contact?

Matthew: I can be reached either at Individual U’s main learning headquarters, the number for which Stephen just listed. Or, at my direct line, which is 973-580-3846 and by e-mail at Matthew.Kelly@alumni.brown.edu.

Stephen: Of course, Angelo, they can also call you. If we’re not together sharing a good Italian meal, then I am sure you will be delighted to tell them how to find us.

Angelo: Absolutely, of course.

Stephen: We hope we will see you at Greenwich or any of the other meetings we are attending. We look forward to seeing fellow FOA colleagues and friends.

Angelo: Thank you so much. Stephen and Matt, this was wonderful. I very much look forward to seeing both of you soon. Thank you so much for your time today in our FOA audio podcast. Everyone have a good day. Thank you.