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**Responsible Leadership and Management Education**

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A paper presented at the ABBS 8th International Conference on the Future of Management Education: Country Specific Design and Delivery with special reference to Developing Countries and Countries in Transition. Bangalore 07 - 08 Jun 2018.

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**Katalin Illes and Michal Zigelman**  
**Responsible Leadership and Management Education**

Paper Proposed for Presentation at the International Conference on the Future of Management Education: Country Specific Design and Delivery with special reference to Developing Countries and Countries in Transition  
Bangalore, 7-8<sup>th</sup> of June 2018

The paper offers a critical overview of business and management education and outlines some recent developments that indicate that change is timely, necessary and possible.

After reviewing the rapidly changing external environment the authors focus on the current realities of leadership and management education and raise some fundamental questions.

These questions include:

- 1) What is the role of business schools in improving society?
- 2) How can leadership education programmes remain relevant and create value for their customers, leaders and managers, in an ever-changing world?
- 3) How can management education bridge the gap between traditional management perceptions and 21<sup>st</sup> century challenges?
- 4) What is our real concern in designing the content of management courses, is the purpose to prepare people for leading a meaningful and productive life or is it academic conservatism, constrains and passing exams?
- 5) How active are business schools and independent consultants in shaping a better future: in changing mindsets and raising responsible leaders for the harsh environmental, political and economic conditions of the world?

The authors draw from their personal experiences as leaders and educators and argue that we need to critically review the curricula of business schools and make the teaching more relevant and practice based for the needs of current and future generations. We believe that it is not enough to talk about the sustainable development goals for example. These goals need to be an integral part of action based learning within our institutions. Students throughout their years at the university could work for example on projects that are contributing to the UN Development Goals. By internalising the Goals and working towards at least one of them would make the global challenge local, personal and real. Students would develop character, tacit knowledge, life skills and a deep sense of responsibility in the learning process, thus becoming change-agents within their communities.

The paper offers powerful individual examples of students and corporates to substantiate the claim that when one's talent, student or corporate, is used to make a local difference for others then the learning is transformational and impacts positively on one's character and outlook on life.

Finally, we offer an innovative and up-to-date framework for developing responsible and relevant leaders for the complex, ever-changing environments of the 21<sup>st</sup> century, both in a corporate and business school setting.

## Introduction

Today organizations function in a complex business environment. Ongoing change, increasing role of networks and intensifying interdependence of multiple diverse actors are among the factors responsible for increased volatility and unpredictable “black swan” events. “Black swan” events, (defined by Taleb 2007), refer to low probability and high impact events, such as the “Dot-Com” crash in 2000, September 11 attacks in 2001, the collapse of Lehman Brothers in 2008, the Greek Government Debt crisis in 2010, the Oil price Slump in 2014, the collapse of the Ruble in 2014, and Brexit in 2016. Reciprocal influences also referred to as “butterfly effects” and unfolding ramifications also threaten business planning and in turn, business results.

Traditional business concepts focusing on planning become less effective when meeting the chaotic, fluid and uncertain reality. Managers and leaders clearly realize that in order to successfully compete with the challenges of complex environments, different rules are required. These rules need to fit with a world of constant change and intensifying interdependence. Capabilities, such as systemic vision, attention and humility, dealing with uncertainty, as well as the ability of rapid sense making, pragmatic decision making and awareness of consequences, all become critical for the organization’s resilience and ability to thrive. Although the need to develop new perspectives to bridge the gaps outlined above in management education are clear, it is less clear how such perspectives and capabilities can be taught.

The global financial crisis, regularly reported fraud cases and leadership misbehaviour raise some serious questions about the current practices of business schools and value of business education to society. Prominent business scholars and practitioners argue that something is deeply problematic in business education today.

“Bad Management Theories Are Destroying Good Management Practices” by propagating ideologically-inspired amoral theories, business schools have actively freed their students from any sense of moral responsibility (Ghoshal 2005: 76).

*Ian I. Mitroff* (2004) claims that business school faculties are at best guilty of having provided an environment where corporate misbehaviour could take roots and flourish. At worst they are guilty of being active accomplices and co-conspirators in criminal behaviour. Mitroff argues that business schools promoted:

- (i) a mean-spirited and distorted view of human nature (by assuming that humans are completely and entirely ruthless, motivated solely by greed, and purely opportunistic);
- (ii) a narrow, outdated, and repudiated notion of ethics (materialistic egoism);
- (iii) a narrow and highly limited definition of the role of management (management is about making money and can be captured solely in economic terms);
- (iv) an overly reified conception of the sub-disciplines of management (a fragmented and separated division of interrelated issues);
- (v) a sense of learned helplessness and hopelessness among business professionals regarding control of their lives (maintaining an attitude that they have no power to change the system in which they find themselves). (quoted in Illes & Zsolnai, 2015)

O’Higgins and Pesqueux (2008) believe that management education as presented in the medium of business schools has acted as a cheerleader for the management models and practices. This is manifested and reinforced by (i) the managerialist perspective; (ii) deference to powerful stakeholders, especially companies/prospective employers of students,

and students themselves as ‘consumers’; (iii) simplistic tools and formulas to train students; (iv) academic tenure and promotion systems; and (v) the extremes of populists and pedantic science.

*Shrivastava* (2011) argues that at present, most business schools teach corporate leaders the art of making money and fail to examine fair corporate governance. It is not surprising that corporate managers, educated without adopting an ethical viewpoint, do not have the framework to address the moral outrage over the societal and environmental impacts of big business that led to the burgeoning criticism.

Flyvbjerg (2001) proposes a clear distinction between the natural and social sciences and argues that each is valuable in its own right. He developed a strong argument for basing social science on the foundation of the Aristotelian concept of *phronesis*. For Aristotle *phronesis* is a “true state, reasoned, and capable of action with regard to things that are good or bad for man.” (Aristotle, 1976. 1140a24-1140b12). “*Phronesis* goes beyond both analytical, scientific knowledge (*episteme*) and technical knowledge or know-how (*techne*) and involves judgements and decisions made in the manner of a virtuoso social and political actor. ....*phronesis* is commonly involved in social science, and that therefore attempts to reduce social science and theory either to *episteme* or *techne*, or comprehend them in those terms, are misguided.” (Flyvbjerg, 2001. p. 2).

*Phronesis* or practical wisdom is particularly important because it balances instrumental-rationality with value-rationality. Such balancing is necessary for an effective holistic response to complex challenges and sustained happiness in society. Current society and organisational life puts far too much emphasis on instrumental-rationality, measurements for the sake of measurements and short-term solutions without considering the long-term, often negative consequences.

In his seminal work “Making Social Science Matter” Flyvberg (2001) argues that rather than trying to research, treat and measure social sciences (and all business school subjects fall into this category) as natural sciences it is high time we put them on a different and solid ground of *phronesis*.

“Just as social science has not been able to contribute with Kuhnian normal science and predictive theory to scientific development, so natural science has had little to offer to the reflexive goals, values, and interests that is a precondition for an enlightened development in any society.” (Flyvberg, 2001. P. 53)

Past experience shows that where natural science is weak social science is strong and vice versa. Aristotle states that we should start with instrumental rationality and it should influence value-rationality. Unfortunately over the century the emphasis was fully on scientific and instrumental rationality and value-rationality was pushed to the margins or was totally ignored.

In this paper we argue that it is high time we started to redress the balance and give more prominence to value-rationality. Business schools and business consultants have a key role to play in challenging the popular mindset and building bridges between scientific knowledge (*episteme*; know why), technical skills or craftsmanship (*techne*; know how) and ‘prudence’ or practical wisdom (*phronesis*).

“Phronesis is that intellectual activity most relevant to praxis. It focuses on what is variable, on that which cannot be encapsulated by universal rules, on specific cases. Phronesis requires an interaction between the general and the concrete; the tangible and the intangible; it requires consideration, judgement and choice. More than anything else, phronesis requires experience. (Flyvberg, 2001. P. 57)

Breaking an old business model is always going to require leaders to follow their instincts. There will always be persuasive reasons not to take a risk. But if you only do what worked in the past, you will wake up one day and find that you’ve been passed by.” (Christensen 1997) The same is true for breaking an old business perception.

The question is how to transform business education in a way that graduates could get a holistic approach together with sufficient experience to make decision based on value rationality as well as instrumental rationality.

### **Whole Person Education**

Rather than copying the methods and methodologies of natural sciences business education should focus on educating the whole person by putting equal emphasis on developing character and values as well as scientific knowledge and technical skills. Mintzberg (2004) criticized the business curricula (especially MBA programmes) arguing that people who take these courses will only be equipped with scientific tools for analysis and decision making. Consequently they will be without the art and craft of leadership and can cause more harm than good in high level corporate positions.

Most organisations express some sort of engagement with Corporate and Social Responsibility (CSR), and the topic is part of the curricula of most business schools together with business ethics. Unfortunately the concepts are often reduced to functional and instrumental management concepts and create an ethics management paradox (Bouckaert (2006). When rational and technocratic management tools are used genuine moral feelings and genuine moral commitments and values are suppressed. The impact of this is visible in the ‘box ticking’ mentality both in business schools and in corporations.

Most people would agree that the world needs wise leaders. There are numerous examples of corruption, greed, self-centredness, short-sightedness and irresponsible actions. These demonstrate the lack of wisdom and the lack of responsible leadership. Wisdom similar to trust is an elusive concept, difficult to define and we often start thinking about it when it is missing. Wisdom is not boastful, it is not self-serving, it is unassuming and when it is present it has a calming and uplifting influence on people and events.

The rhetoric is changing in business education but that does not necessarily mean the change of the dominating mind-set and behaviour. Business education has yet to embrace the responsibility of preparing students for life by giving them opportunities for self-discovery, and for development of personal mastery, integrity and wisdom.

“Doing deals doesn’t yield the deep rewards that come from building up people”(Christensen, 2010). Business education in its current form provides plenty of opportunities for the acquisition of rational knowledge. There is no shortage of support for those who buy into the ideology that promotes financial success as a measurement of value. Character formation, the development of virtues seems to fall outside the remit of business education (Wall, Platts, and Illes 2007). It can be argued that character is formed in the family and throughout

primary and secondary education and in education for the profession only specific scientific and technical knowledge should be transmitted. But as ethics and value-creation are integral aspects of any professional challenge, ethics and value-commitment should be fundamental parts of any mature profession, especially management and business education.

Many authors have called for a fundamental reform of business education. Some have argued that our traditional educational approaches are deeply rooted in a mechanistic view of management and leadership evoking the illusion of predictability and control (Berends and Glunk 2006), whereas daily experience in the workplace, especially in the complex environments of the 21<sup>st</sup> century, shows that events are not necessarily predictable or controllable. Even the deployment of increasingly sophisticated information and decision support systems cannot take away the need for human judgment. Business practice shows that success in managerial and leadership roles depends to a great extent on the level of maturity, growth, self-awareness and personal mastery (Covey 1992; Platts 2003).

Schools in their original sense provided free space for inquiry and discovery and have played an important role in the formation of character and morality over the centuries. It would be timely to re-introduce the concept of '*free space*' of inquiry in business education and encourage students to formulate their own ideas through dialogue and personal reflection while dealing with real complex challenges before they set their foot on the corporate ladder (Illes 2004).

“What is clearly needed is a change in the mind-set, values and principles of our leaders, as well as of those who finance our enterprises, and of those who teach and mentor our future leaders. At the very minimum, what is needed is an expansion of the concept of ‘success’ so that it transcends the prevailing myopic focus on short-term financial gains.” (Pruzan and Pruzan 2007: 6)

Encouraging students to formulate their own definitions of success is one of the first basic steps that business school professors could do. Allowing time and creating opportunities to explore questions about meaning and the idea of a ‘good life’ can give students a chance to formulate their own ideas about life in line with their conscience.

By including philosophy, ethics, and wisdom traditions into the curriculum of business education and allowing time and free space for honest dialogue on them educators can enable students to make the shift from competition to collaboration, from knowledge hoarding to knowledge creation and sharing, from exploiting private opportunities to contributing to the overall well-being of society.

### **Connecting natural and social sciences to create an innovative, up-to-date perspective on leadership**

Moral leadership is expected from everyone in a leadership position. The challenge is to be a moral and responsible leader when circumstances or self-interest conflict with our values or with the common good of the followers or of society.

Education institutions are supposed to equip leaders or future leaders with the framework, the values and tools that help to solve those unavoidable conflicts of interest or to handle the dilemmas encountered in the leadership position. Leaders in all walks of life should see their contribution to ‘make the future better’ as a categorical imperative embedded in the very nature of their position. (Bettignies, H-C. 2016)

Today leaders function in complex environments. They are expected to recognize and to make sense of the continuously changing circumstances and by being attentive to global “winds” and emerging needs of their customers, leaders are expected to design the space for necessary organizational changes to happen.

The new sciences of complexity and networks theories suggest a systemic, holistic view of leadership in an ever-changing, interconnected world. In this part of the paper we offer a tried and tested method of combining instrumental and scientific rationality with value rationality to create a relevant and responsible model of leadership.

The Natural Systems (NS) approach provides a systemic view of 21<sup>st</sup> century environments. According to this approach, business, social and life systems are an integral part of nature. Hence, teams, organizations, corporations or economic environments, as well as biologic or climate systems, are all “eco-systems”, subject to the same regularity - the universal regularity of nature. From that point of view, connectedness and interdependence are inherent qualities of all business or life environments.

The NS perspective was developed by Michal Zigelman over 15 years of physics research at Tel Aviv University in Israel. It draws on concepts from three scientific pillars: Quantum Physics, Complexity Theory, and Network Science.

Looking at the leadership practice through the lens of NS, capabilities such as "deep listening" to global signals, awareness of people’s needs and ability to respond harmoniously, turn to be necessary tools for responsible and meaningful leadership. Mastering these capabilities can affect corporate market advantage and the business bottom line.

NS calls for the following principals:

**Expanding leadership values** – Sustainability, holism, connectedness and harmony, are by definition inherent properties of every system in nature. From the NS perspective, these qualities naturally become core values of a leader who wish to respond effectively to challenges of the eco-system. If we are all connected than we are responsible not only for our personal well-being but the wellbeing and flourishing of all.

**Creating a better world** – by cultivating responsible and authentic leaders, attentive to the changing needs of the people and the environment and raising their potential to responding effectively and to improving innovation when dealing with complex challenges.

**Bridging the gap** – As mentioned above, a worrying gap appears today between old school leadership perceptions and the challenges and needs of society and the world in the complex 21<sup>st</sup> century environments. Traditional business education programmes further deepen this gap, by ignoring these needs.

The approach suggested by the authors, that integrates Natural and Social Sciences, deals directly with this gap by offering a change in mindset as well as an expansion of the traditional leadership paradigm. Moving beyond the either/or paradigm and including intangible capabilities such as awareness, communication, listening and compassion, as fundamental skills of leadership, may overcome the inherent tension between mind and heart and provide a holistic leadership framework, compatible with contemporary social and global challenges.

**How is change created?** We recognize change as a process that develops over time, not by opposing conventional perceptions but rather by cultivating a relevant paradigm of

leadership, creating supportive environments for the new paradigm to flourish and responding appropriately to the changing needs. We believe that the way to start the process towards responsible leadership is by encouraging an authentic kind of conversation and self-inquiry among current and future leaders and developing management education programmes based on holistic and interdisciplinary view.

### **Practical examples**

One of the authors has been teaching on MBA and executive MBA programmes for over a decade. She has found that many course participants are seeking to make changes in their lives and careers. So she consciously offers space to review values, purpose and meaning and invites participants to consider ‘what if’ questions. In the free space and through stimulating, and often challenging discussions participants start to consider issues from multiple perspectives and emerge with a fresh outlook on life and with new sets of priorities.

To illustrate the transformation that can happen in such a learning environment we shall summarize this author’s factual account of how the lives and views of two course participants transformed during their post-graduate studies at a university.

- a. Jennifer is in her early forties. At the beginning of her MBA Jennifer took a leadership module that focused on the qualities and responsibilities of leaders. She became particularly interested in the moral obligations and our responsibility to take care of others, particularly the less fortunate and vulnerable around us. Jennifer attended a study trip to Ghana and saw personally the hardship that lack of clean water can cause to a community. When Jennifer saw a broken well and learnt that children from the village had to walk miles to get some muddy water she decided to take action. Jennifer used her social network of friends and colleagues to raise sufficient funding for a well that was drilled shortly after the trip. This was a turning point in Jennifer’s life as she realized that individual actions can make a huge difference. She volunteered to work for an NGO and supported migrants and asylum seekers in North London. This experience was truly life transforming and led not only to a first class dissertation but also a more fulfilling and purpose driven career. She decided to change career and use her talent to serve the needs of the vulnerable. When Jennifer joined the MBA she was a successful barrister and by the time of her graduation she set up her own social enterprise to work with victims of human trafficking and develop policy documents to eliminate human trafficking in the UK. Although her working life is not easy she finds that her days are purposeful as she is able to ease the suffering of others in all sorts of ways.
- b. Rachel holds a senior financial position in a multi-national pharmaceutical company. For her first assignment on the MBA she set up an initiative in the spirit of the UN’s Sustainable Development goals to increase the recycling of plastic in the whole organization. She organized fund raising events, raised awareness by talking to smaller and larger groups, recruited volunteers to collect and reduce plastic waste on the different production plants in different countries. She demonstrated that practicing corporate and social responsibility can strengthen the connections between people in the workplace and in the environment where the business is conducted. At the time of writing Rachel is half way through her two year MBA programme. She is currently organizing a fund raising campaign throughout her multinational pharmaceutical company to cover the costs of primary school education of 20+ children in rural India.



Rachel intends to use her talent and education to make a difference in other people's lives and through her formal position and with her responsible attitude to leadership raise awareness about our individual and collective responsibilities.

The following examples are based on the second author's experience in leadership development consulting with Israeli leading organisations. Although the two organisations are in different business environments, they both demonstrate how an organisation can grow and thrive in complex and competitive markets. These two organisations integrate hard-core business principles and Natural Systems values of sustainability and harmony with people and the environment.

## **Hishtil**

Founded in 1974, Hishtil is a world leader in seedlings and growing young plants of herbs, ornamentals and vegetables. Being a market leader in the world of advanced horticultural nurseries, the company is constantly developing unique technologies and production techniques in order to keep up with the ever changing market demands.

Based on its experience and capabilities, Hishtil established a global nurseries network comprised of four sites in Israel and six joint venture nurseries in Turkey, South Africa, Italy, Spain, Bosnia & Herzegovina and the USA (North Carolina) producing over a billion high quality young plants yearly. Hishtil employs approximately 400 people in Israel in addition to another over 500 through its international joint ventures.

The company is renowned for being at the forefront of knowledge in plant propagation. Its innovative approach combines horticulture expertise and industry awareness with the benefits of cutting-edge technology, resulting in production of the healthiest possible plant materials.

Hishtil is dedicated to provide economic and environmentally friendly horticultural solutions that improve the quality of food. Through a natural landscape rehabilitation project the company is deeply involved with the exciting demonstration of its commitments.

Hishtil's is highly attentive to global and local changes and is constantly integrating new insights and technologies to satisfy their customers' changing needs. The company's responsible leadership demonstrates how a company can grow and thrive in a volatile and competitive market being driven by the core values of integrity, reliability, industry responsibility and sustainability.

<https://www.youtube.com/watch?v=jKmOq143L2w&feature=youtu.be>

## **SodaStream Israel**

SodaStream ( <http://www.sodaclub.com/ourvision>) is the world's largest manufacturer, distributor and marketer of Home Carbonation Systems (market cap 2017- \$1.7 billion) The company has a clear vision of benefiting both consumers and the environment. SodaStream mission is to revolutionize the beverage industry by providing a better alternative and environmentally friendly way for consumers to prepare their own carbonated beverages.

SodaStream employs more than 1,000 people worldwide. In its workforce over 30 nationalities are represented. The company's headquarters are located in Israel and with 22 manufacturing facilities around the world, including: in Israel, the West Bank, Germany,

Sweden, US, Australia, South Africa and China. The company's brands are sold in over 60,000 retail stores in 45 countries

Guided by its charismatic CEO, Daniel Birnbaum, SodaStream is well known for its responsible and caring leadership. The company is not only committed to the environment but also to building a bridge of peace between Israelis and Palestinians.

SodaStream, an Israeli company, employs 500 West Bank Palestinians. For Daniel Birnbaum, treating Arabs and Jews equally adheres to the company's core values. "We practice equality and full cooperation both on the job and off it" Birnbaum said. By supporting neighbours working alongside each other, receiving equal pay, equal benefits and equal opportunities, SodaStream is contributing to the co-existence between two populations that have been historically in conflict.

Birnbaum: "As an Israeli, I am proud to be part of an organization that not only provides value to its shareholders, but also brings a message of peace and brotherhood between Jews and Arabs, and is leading an environmental revolution in the global beverages market from Israel. We are committed to continue to serve as a bridge and to continue sowing hope".

The following video can demonstrate, beyond words, the impact that can be created by a leader with a long-term vision, compassion and systemic responsibility.

[https://www.youtube.com/watch?v=-8j\\_o-7rosU&feature=youtu.be](https://www.youtube.com/watch?v=-8j_o-7rosU&feature=youtu.be)

## **Quantum approach to Leadership**

In this part of the paper we offer a tried and tested framework to leadership that enables the development of responsible leaders for complex environments. We believe that this framework is equally suitable for corporate and business school settings and offers a rich and powerful context for transforming both individual and collective mindsets.

The **Quantum Approach to Leadership (QAL)** is a pragmatic framework for cultivating relevant and responsible leaders for the complex environments of the 21st century.

The Quantum Approach to Leadership suggests a paradigmatic transformation. From the traditional mechanistic approach, based on linear thinking, measurement, planning and absolute control, to the "Natural Systems" approach which is based on complexity comprehension, systemic view, networks perception and agility. The QAL suggests moving beyond the "either/or" paradigm to a holistic, interdisciplinary approach to complex situations, while recognizing the connectedness and interrelationships among all "actors" in an eco-system and their long-term effect on the eco-system. From "change management" to "change-engagement", the QAL approach is based on evaluating change as a vital quality for growth, innovation and resilience in a complex world.

QAL's main goal is to cultivate responsible leaders, who are equipped with the relevant mindset and practical knowledge to making effective decisions and provide innovative solutions to complex challenges, while contributing meaningfully to the society and the environment. QAL is inspired by and draws from scientific principles of physics, complexity theory and network theory and combines these with value-rationality.

QAL is a new paradigm, fundamentally different from the current leadership paradigms. It cannot be achieved by either a linear or an incremental development of the current paradigm;

it takes a “Quantum leap” to go beyond the well-known methods to adopt this innovative model. This is exactly what we offer in the Quantum Approach to Leadership programmes.

The QAL program suggests a pragmatic framework to cope with the challenges of the contemporary disruptive business market. It equips leaders and managers with an up-to-date, **systemic and strategic vision of the business arena, along with a set of skills and practical tools** for effective decision making in conditions of ambiguity and uncertainty.

The QAL programme creates an inspiring “free-space” for leaders and managers for developing life and professional capabilities, such as agility, critical thinking, improvisation, initiative, creativity and effective communication, needed when coping with complex challenges.

### **Central issues in the QAL programme**

- The team, organization, the business and global arena –rules of the game in complex systems
- Threats and opportunities in a complex business environment.
- Connectedness and the “Butterfly Effect” in business and social environments.
- The Bimodal Management<sup>©</sup> - a model for effective management in change and uncertainty
- Decision making in complex and uncertain conditions.
- Ongoing innovation in a disruptive market
- The human behavioural biases in conditions of change and uncertainty
- Effective communication, influence and motivational tactics
- Emotional management and efficient conduct in conflict
- Managerial failures in complexity
- How to implement new habits in life and in work

The Natural-Systems is a holistic approach, that provides a basic lens for the QAL, plays an important role in balancing the stressful gap between practical, quantitative conventional management models and the multi-dimensional, non-tangible and emotional aspects of complex environments. The QAL programme is aimed to fortify one’s personal and organizational resilience in change and promote a change-improved culture within organisations.

### **Conclusions**

In this paper the authors argued that the rapidly changing, unpredictable social, political and business environment requires a different, more complex and more interconnected view of the world. Changing mindsets is not easy and it can only happen with the active participation and willingness of the individuals. This process is helped a great deal when business education moves beyond the linear, predictable and certainty based models of instrumental rationality and embraces a more circular, unpredictable and nature driven value-rationality. By finding meaningful ways of combining what science offers with virtue based philosophies can contribute to our understanding of the world and our roles and responsibilities in it. By using a new paradigm we have the opportunity to review our purpose and what we are trying to contribute to the well-being of others both individually and organizationally.

The paper offers two examples of personal transformation through business education and two corporate examples where responsible leadership and meaningful working life are

continuously practiced. The authors briefly outline the concept of Quantum Leadership and argue that it is possible to transform mindsets and lives by offering the most relevant aspects of natural sciences and social sciences in our educational and development programmes.

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**Michal Zigelman** ([michal@duality.co.il](mailto:michal@duality.co.il)) is a cross-disciplinary physicist and leadership development expert. She is the founder and CEO of Duality, a boutique leadership development firm based in Tel Aviv, Israel. Michal has pioneered the application of nature and physics principles (i.e. Quantum theory and Complexity theory) in organizations to help organizational leaders navigate the complex and uncertain business and government landscape of the 21<sup>st</sup> century. Using her pioneering "Bimodal Management ©" model, Michal has helped some of Israel's top business, finance, and government organizations to redefine organizational paradigms, adopt change, and deliver operational excellence. Michal lectures regularly on Disruptive Innovation, Leadership, Decision Making, Risk Management, and Effective Communication.

Michal holds Master's and Bachelor's degrees in Physics and a diploma in Leadership Development from Tel-Aviv University. She is certified in Disruptive Strategy with Prof. Clayton Christensen at Harvard Business School (HBX program). She is a certified executive coach. For further information – <http://en.duality.co.il/>.