ARAB GULF PROGRAMME FOR DEVELOPMENT - AGFUND
برنامج الخليج العربي للتنمية - أجفند

المجلس العربي للطفولة والتنمية
Arab Council for Childhood and Development

The Empowerment of the Arab Child in the Era of the Fourth Industrial Revolution

Abstract

The Empowerment of the Arab Child in the Era of the Fourth Industrial Revolution

Abstract

The Arab Council for Childhood and Development (ACCD) is an Arab regional non-governmental organization working in the field of childhood development. ACCD was established in 1987 upon the initiative of HRH Prince Talal Bin Abdul Aziz, ACCD's President, and a resolution issued by the League of Arab States.

The Empowerment of the Arab Child in the
Era of the Fourth Industrial Revolution

November 2018

Correspondences:
Arab Council for Childhood and Development
Intersection of Makram Ebeid & WHO Streets,
Nasr City, P.O. Box: 5737, Cairo 11762, Egypt.
Phone: +202 23492024/25/29
Fax: +202 23492030
www.arabccd.org accd@arabccd.org

Partners

Arab Council for Childhood & Development (ACCD)

ACCD is an Arab regional non-governmental organization working in the field of childhood development. ACCD was founded in 1987 upon the initiative of HRH Prince Talal Bin Abdul Aziz, ACCD's President, and a resolution issued by the League of Arab States.
www.arabccd.org

Arab Gulf Programme for Development (AGFUND)

AGFUND is a regional organization that was established in 1980 upon the initiative of HRH Prince Talal Bin Abdul Aziz, AGFUND's President, with the support of leaders of the Gulf Cooperation Council Countries. AGFUND works mainly in the field of development and growth at the international level through an effective partnership with the United Nations Organization, with regional and national development organizations, with public institutions, with the private sector, as well as with organizations of the civil society. www.agfund.org

The League of Arab States - Women, Family and Childhood Department - Social Affairs Sector

The Women, Family and Childhood Department, subordinate to the Social Affairs Sector at the General Secretariat of the Arab League, is the Technical Secretariat of the Arab Women's Committee, the Committee of Arab Children and the Committee of the Arab family, which have been established by the resolutions of the Arab Council of Social Affairs Ministers. The Department is divided into three sections; where their functions are integrated in addressing issues related to women, family and childhood. www.lasportal.org

Supreme Council of Culture – Egypt

The Supreme Council of Culture seeks to coordinate governmental and non-governmental efforts in the fields of arts, literature and social sciences, as well as the Council plays its role in the cultural and intellectual life in Egypt. The Council's Committees include an elite of Egyptian intellectuals representing different generations and trends. http://scc.gov.eg

Dialogue Center for Political & Media Studies – Egypt

The Center is considered to be an independent research institution concerned with political and media studies that seeks to expand the categories of those interested in the political and media life in the Arab society in general and in Egypt in particular. This is done in order to formulate and develop the political awareness of the public opinion, as well as to deepen the political knowledge of the elite, decision-makers and institutions concerned with political work and community activities.

The Empowerment of the Arab Child in the Era of the Fourth Industrial Revolution

Abstract

In accordance with its vision of enabling Arab children to participate in the development of their societies and dealing with the rapid global changes, ACCD has initiated to organize two workshops, under the auspices of HRH Prince Talal Bin Abdel Aziz, on the issue of Arab children's empowerment in the era of fourth industrial revolution.

This book reviews the outcomes of these two workshops, as well as the scientific papers and researches that were discussed by an elite of specialized experts in this field.

ACCD held the first workshop in its headquarters (Cairo) from the 28th of February to the first of March 2018, in collaboration with AGFUND, the League of Arab States (LAS), the Egyptian Supreme Council for Culture and Dialogue Center for Political and Media Studies.

The second workshop was held by ACCD on the 14th of October 2018 in Cairo, in parallel with the activities of the 5th Arab Civil Society Forum for Children (held on 13 – 14 October 2018 in Cairo).

This book includes the full Arabic versions of the scientific papers and researches that were discussed in the workshops, which tackled the following topics:

- Children and technology.
- Children and scientific thinking.
- Children and learning philosophy and logic.
- Art as an approach for learning.
- Developing children's creativity.
- Citizenship.

ACCD considers the importance of linking the above-mentioned topics to

the process of upbringing that enables Arab children to absorb the variables of the industrial and scientific revolution surrounding us. These variables are represented in the tremendous progress achieved by the fourth industrial revolution; therefore, it is essential to enable the means and approaches of child upbringing to benefit from the results of this scientific and technological revolution and deal with its impact on pedagogy, education, society and human.

The two workshops have aimed to empower Arab children in the era of the fourth industrial revolution through discussing a number of scientific concepts and cognitive components, considering the intellectual and social dimensions of this new industrial revolution in terms of its impact on the conceptual structure of the Arab children, and thus its impact on citizenship and social justice.

The recommendations of the two workshops have stressed the importance of preparing Arab children to the fourth industrial revolution regarding its opportunities and challenges. In this context, children upbringing should be carried out within an integrated and interrelated conceptual structure, as well as the values and capacities (that are required to be developed) should be reconstituted in a new intellectual pattern, which establishes an effective relationship between children and the fourth industrial revolution.

It is worth mentioning that ACCD, in partnership with AFGUND, is implementing a new model for Arab child upbringing entitled «Education for Hope» under the slogan «New Mind .. New Human .. New Society». The new model that ACCD is practically implementing in all its areas of work and activities is a comprehensive model that aims at developing children›s awareness and awakening their creative self, in addition to unleashing their creative human energies and building their abilities, in order to help them live a decent life, achieve positive citizenship and enable them to help their Arab countries towards establishing knowledge society.

According to the outcomes of the above-mentioned workshops, ACCD is currently adopting a post-2020 prospective strategic approach based on empowering Arab children in the era of fourth industrial revolution.

Artificial Intelligence & Future Life

Dr. Gevara Al Behairy

A.I. & FUTURE LIFE

ROUND TABLE
Arab council for childhood & Developme
28 Feb. – 1 March Y2018

Gevara Al Behairy B.Phsc.MBA
galbehairy@gmail.com

INSIDE THIS DOC.;

"It is going to be interesting to see how society deals with artificial intelligence, but it will definitely be cool."—Colin Angle

Introduction

From SIRI to self-driving cars, artificial intelligence (AI) is progressing rapidly. While science fiction often portrays AI as robots with human-like characteristics, AI can encompass anything from Google's search algorithms to IBM's Watson to autonomous weapons.

Artificial intelligence today is properly known as narrow AI (or weak AI), in that it is designed to perform a narrow task (e.g. only facial recognition or only internet searches or only driving a car). However, the long-term goal of many researchers is to create general AI (AGI or strong AI). While narrow AI may outperform humans at whatever its specific task is, like playing chess or solving equations, AGI would outperform humans at nearly every cognitive task. In the near term, the goal of keeping AI's impact on society beneficial motivates research in many areas, from economics and law to technical topics such as verification, validity, security and control. Whereas it may be little more than a minor nuisance if your laptop crashes or gets hacked, it becomes all the more important that an AI system does what you want it to do if it controls your car, your airplane, your pacemaker, your automated trading system or your power grid. Another short-term challenge is preventing a devastating arms race in lethal autonomous weapons. In the long term, an important question is what will happen if the quest for strong AI succeeds and an AI system becomes better than humans at all cognitive tasks. As pointed out by I.J. Good in 1965, designing smarter AI systems is itself a cognitive task. Such a system could potentially undergo recursive self-improvement, triggering an intelligence explosion leaving human intellect far behind. By inventing revolutionary new technologies, such a super intelligence might help us eradicate war,

disease, and poverty, and so the creation of strong AI might be the biggest event in human history. Some experts have expressed concern, though, that it might also be the last, unless we learn to align the goals of the AI with ours before it becomes super intelligent.

There are some who question whether strong A.I. will ever be achieved, and others who insist that the creation of super intelligent AI is guaranteed to be beneficial.

AI concept

A.I. idea was introduced by John Mccarthy in 1955 at Dartmouth conference, where the original definition/concept of A.I. was explained;

"Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to stimulate it. An attempt will be made to find how to make machines use language, from abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves."

"Artificial intelligence is growing up fast, as are robots whose facial expression can elicit empathy and make your mirror neurons quiver."

— Diane Ackerman

Then, the original 7 aspects of A.I. were concluded;

1. *Simulating higher functions of the human brain.*
2. *Programming a computer to use general language.*
3. *Arranging hypothetical neurons allowing them to from concepts.*
4. *A way to determine & measure problem complexity.*
5. *Self-improvement.*
6. *Abstraction; quality of dealing with ideas rather than events.*
7. *Randomness and creativity.*

There are different types of A.I. based on approach;

- Strong A.I. can do anything as well/better than human
- Weak A.I. achieves only the results of a human

A.I. applications;

- Education (children)
- Computer science
- Hospital & medicine
- Aviation
- Finance
- Heavy industry
- HR & recruiting
- Transportation
- * Marketing
- * Music
- * News, publishing & writing
- * Customer services
- * Toys & games
- * Telecom maintenance
- * Human goodness
- * Others

A.I. & Adults / Children life

In the future, service robots equipped with artificial intelligence (AI) are bound to be a common sight. These bots will help people navigate crowded airports, serve meals, schedule meetings or even children teaching etc.....

As these AI systems become more integrated into daily life, it is vital to find an efficient way to communicate with them. It is obviously more natural for a human to speak in plain language rather than a string of code. Further, as the relationship between humans and robots grows, it will be necessary to engage in conversations, rather than just give orders. This human-robot interaction is what Manuela M. Veloso's research is all about. Veloso, a professor at Carnegie Mellon University, has focused her research on CoBots, autonomous indoor mobile service robots which transport items, guide visitors to building locations, and traverse the halls and elevators. The CoBot robots have been successfully autonomously navigating for several years now, and have traveled more than 1,000km. These accomplishments have enabled the research team to pursue a new direction, focusing now on novel human-robot interaction. "If you really want these autonomous robots to be in the presence of humans and interacting with humans, and being capable of benefiting humans, they need to be able to talk with humans" Veloso says.

"Someone on TV has only to say, Alexa, and she lights up. She's always ready for action, the perfect women, never says, not tonight, dear." - Sybil Sage, as quoted in *New York Times* article

"Human plus machine isn't the future, it's the present," Garry Kasparov said in a recent TED talk. And this "present" is transforming the world of education at a rapid pace. With children increasingly using tablets and coding becoming part of national curricula around the world, technology is becoming an integral part of classrooms, just like chalk and blackboards. And now virtual reality (VR) and AI are gaining traction.

A recent report by Pearson deciphers how AI will positively transform education in the coming years. Imagine lifelong learning companions powered by AI that can accompany and support individual learners throughout their studies – in and beyond school – or new forms of assessment that measure learning while it is taking place, shaping the learning experience in real time.

A variety of artificial reality tools including Microsoft's Hololens, Oculus Rift, or Google Expedition are trnslating traditional lessons into meaningful real-world experience. *"We are moving away from simply learning a subject or topic to feeling the conten. This is not simply an engagement tool or gimmick, it allows a student to explore, to experience or to be involved in something, as if they are acctually present in that environment or place"* – Graeme Lawrie, Director of innovation & outreach at the U.K.-based Sevenoaks school.

AI impact on society

During Oct., 2017 " Tokyo AI & society symposium " was held discussing the impact of AI on society for one week . Overall, Japanese researchers seemed more open to discussing controversial topics like human-level AI and consciousness than their Western counterparts. Most people were more interested in near-term AI ethics concerns but also curious about long term problems..

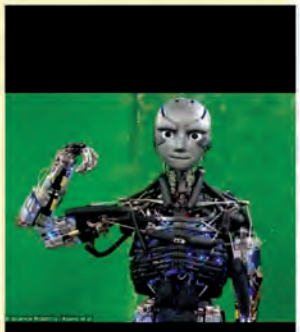
Today, the combined wealth of eight richest people in the world is greater than that of the poorest half of the global population. That is 8people have more than the combined wealth of 3,600,000,000 others. This is already an extreme example of income inequality, but if we don't prepare properly for artificial intelligence, the situation could get worse. In addition to the obvious economic benefits that would befall whoever designs advanced AI first, those who profit from AI will also likely have: access to better health care, happier and longer lives, more opportunities for their children, various forms of intelligence enhancement, and so on. Our approach to technology so far has been that whoever designs it first, wins — and they win big. In addition to the fabulous wealth an inventor can accrue, the creator of a new technology also assumes complete control over the product and its distribution. This means that an invention or algorithm will only benefit those whom the creator wants it to benefit. While this approach may have worked with previous inventions, many are concerned that advanced AI will be so powerful that we can't treat it as business-as-usual.

What if we could ensure that as AI is developed we all benefit? Can we make a collective — and pre-emptive — decision to use AI to help raise up all people, rather than just a few?

Joshua Green, a professor of psychology at Harvard, explains his take on this Principle: "We're saying in advance, before we know who really has it, that this is not a private good. It will land in the hands of some private person, it will land in the hands of some private company, it will land in the hands of some nation first. But this principle is saying, 'It's not yours.' That's an important thing to say because the alternative is to say that potentially, the greatest power that humans ever develop belongs to whoever gets it first."

A.I. researcher **Susan Craw**, also agreed with the Principle, and she further clarified it. "That's definitely a yes," Craw said, "But it is AI technologies plural, when it's taken as a whole. Rather than saying that a particular technology should benefit lots of people, it's that the different technologies should benefit and empower

Human / machine interaction



Engineers in Japan have turned to human body for inspiration for a new robot capable of performing a range of lifelike movements. Instead of seeking perfection, experts recreated the intricacies of the skeleton and its surrounding tissue, with all the imperfections that entails

"There is no reason and no way that a human mind can keep up with an artificial intelligence machine by 2035." – Gray Scott

However, as is the case with all of the Principles, agreeing with them is one thing; implementing them is another. John Havens, the Executive Director of The IEEE Global Initiative for Ethical Considerations in Artificial Intelligence and Autonomous Systems, considered how the Shared Benefit Principle would ultimately need to be modified so that the new technologies will benefit both developed and developing countries alike. "Yes, it's great," Havens said of the Principle, before adding, "if you can put a comma after it, and say ... something like, 'issues of wealth, GDP, notwithstanding.' The point being, what this infers is whatever someone can afford, it should still benefit them."

The Challenge we face

Universal challenges;

For many years, artificial intelligence (AI) research has been appropriately focused on the challenge of making AI effective, with significant recent success, and great future promise. This recent success has raised an important question: how can we ensure that the growing power of AI is matched by the growing wisdom with which we manage it? In an open letter in 2015, a large international group of leading AI researchers from academia and industry argued that this success makes it important and timely to research also how to make AI systems *robust* and *beneficial*, and that this includes concrete research directions that can be pursued today. In early 2017, a broad coalition of AI leaders went further and signed the Asilomar AI Principles, which articulate beneficial AI requirements in greater detail. The first Asilomar Principle is that *"The goal of AI research should be to create not undirected intelligence, but beneficial intelligence,"* and the second states that *"Investments in AI should be accompanied by funding for research on ensuring its beneficial use, including thorny questions in computer science, economics, law, ethics, and social studies..."*

"I'm more frightened than interested by A.I. – in fact, perhaps fright and interest are not far away from one another. Things can become real in your mind, you can be tricked, and you believe things you wouldn't ordinarily. A world run by automatons doesn't seem completely unrealistic anymore. It's a bit chilling"
– Gemma Whelan

The Challenge we face

"Artificial intelligence will reach human levels by around 2029. Follow that our further to, say, 2045, we will have multiplied the intelligence, the human biological machine intelligence of our civilization a billion-fold"

- **Ray Kurzweil**

Regional & local challenges;

Needless to say that, some of our neighbors in the Middle East region are much more ready to strongly interact with AI in fruitful and beneficial way since they have done their homework in building up the favorable infrastructure & human capabilities and social mindset require to accommodate AI in a phenomenal fashion, this is mainly due to, their clear vision, passion and commitments to actively contribute in shaping the new phase of human civilization, and partially due to, the political as well as economic stability these countries were enjoying for decades. For the Egyptian case, like the rest of the region and whole developing world, we have to save no efforts at all levels to catch up with universal tsunami of the "4th industrial revolution" by adopting a national strategy for social enlightenment (including Education & scientific researches, all kinds of cultures & arts, economic developments, mass / media communication, technology adoption in day to day life activities, and Others..) i.e. articulation of borderless Egyptian mind.

Summary

The face of universe / life is changing & human civilization is reshaping for happier existence than what we have ever experienced before by creating a wonderful world to live. It's our choice whether to join and enjoy the future or to be left behind.....

In conclusion, the near universal future could be either very pleasant or very hard & tough for societies to cope with, mainly based on their readiness a/o ability to adopt mental paradigm shift from "it's impossible" to "impossible is nothing".

Artificial Intelligence (AI) & future life…..

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

History of Industrial Revolution - principles

1st (IR) – urbanization & steam engines, 18th / 19th centuries
- Textiles & Iron

2nd (IR) – mass production, beginning of 20th century
- Factory lines

3rd (IR) – digital revolution, 1980s
- PC & internet ……. mobile

4th (IR) – Technology embedded in society, 2000s
- Robotics, AI, Quantum computing, digital fabrication

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

Artificial Intelligence (AI) & future life…..

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Concept – definition

"…. AI is a machine with the ability to solve problems that are usually done by us, humans with our natural intelligence"

Dartmouth AI conference 1956

John McCarthy
1927 - 2011

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Concept- principles

1. Simulating higher functions of the human brain.

*2. Programming a computer to use general language.**

3. Arranging hypothetical neurons allowing them to from concepts.

*4. A way to determine & measure problem complexity.**

*5. Self-improvement.**

6. Abstraction; quality of dealing with ideas rather than events.

7. Randomness and creativity.

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Concept- what is intelligence?

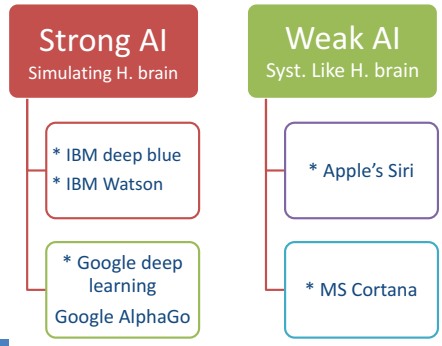
- Generalization learning
  Ability to perform better at situations not previously uncounted
- Reasoning
  Draw conclusion appropriate to situation in hand
- Problem solving
  Given such & such data , reaching (x) conclusion
- Perception
  Analyzing scanned environment in relation to different objects
- Language understanding
  Simulation human language understanding

Jack Copeland
Author of 7 books on AI

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Concept- types of AI



Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Concept- Expert systems

- Most AI algorithm are expert systems

  " systems employ human knowledge in a computer to solve problems that require human expertise"

- Practical application of knowledge database

AlphaGo

AI presentation\AlphaGo Official Trailer.mp4

Demis Hassibas
CEO Alphago,
Google DeepMind

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

Artificial Intelligence (AI) & future life.....

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

AI Shaping daily life

AI For Good

AI to address socially relevant problems such as homelessness. At Stanford, researchers are using AI to analyze satellite images to identify which areas have the highest poverty levels

Aviation

Gate allocation for plane while landing.
Ticket price determination.

Education

There are a number of companies that create robots to teach subjects to children ranging from biology to computer science, though such tools have not become widespread yet

AI Shaping daily life *(Cont'd)*

Healthcare

Companion robots for the care of the elderly
Mining medical records to provide more useful information
Design treatment plans
Assist in repetitive jobs including medication management
Provide consultations
Using avatars in place of patients for clinical training

Heavy Industry

Robots have become common in many industries and are often given jobs that are considered dangerous to humans. Robots have proven effective in jobs that are very repetitive which may lead to mistakes or accidents due to a lapse in concentration and other jobs which humans may find degrading.

Finance

- Algorithmic Trading
- Market Analysis and Data Mining
- Personal Finance
- Portfolio Management
- Underwriting

AI Shaping daily life* *(Cont'd)*

Healthcare

https://www.tmc.edu/news/2018/03/musician-plays-flute-deep-brain-stimulation/

https://t.co/8AGV4WAS1a. This start –up wants to digitalize your brain

https://t.co/uvz1eJ47lx. Artificial uterus

Artificial Intelligence (AI) & future life…..

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Impact of AI on Society

- Equality Issue; (Country, Private co., Individuals)
  - Couriers jobs (delivery drones) e.g. Amazon & DHL — AI presentation\Amazon Prime Air.mp4
  - Cooks job (Robotic kitchen) e.g. Moley — AI presentation\Moley.mp4
  - Cashiers (A.I. shopping tech) e.g. AmazonGo — AI presentation\AmazonGO.mp4
  - Customer service representatives (Bots) e.g. chatbots
  - Drivers (self-driving technology) eg. Tesla, Uber, google — AI presentation\Driverless car in Downtown Dubai.mp4

Impact of AI on Society* *(Cont'd)*

- Equality Issue; (Country, Private co., Individuals)
  - Robot Farmers e.g. Angus — AI presentation\Robot farmers.mp4
  - Robot pilots e.g. Boing 747 — AI presentation\robot pilot.mp4
  - Autonomous Cleaning e.g. Globotix — AI presentation\Avidbotsneo.mp4
  - Robot Cashiers e.g. McDonald - Egypt

Artificial Intelligence (AI) & future life…..

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Challenges

AI presentation\Boston Dynamics.mp4

AI presentation\AI FOR GOOD.mp4

Challenges* *(Cont'd)*

" We can see prototypes of autonomous weapons under Development today by many Nations including the US, China, Russia & the UK.

We are locked into an arms Race that no one wants to Happen. KAIST's actions will Only accelerate this arms Race. We cannot tolerate this"

Prof. Toby Walsh
University of New South Wales

- Korea Advanced Institute of Science & Technology (KAIST)
- Hanwha Systems (weapons factory)
- 50 AI experts signed letter of concern

Challenges* *(Cont'd)*

Summary

- " The development of full (AI) could spell the end of human race……It would take off on its own and re-design itself at an ever increasing rate. Humans, who are limited by slow biological evolution, couldn't compete and would be superseded." -Stephen Hawking told BBC

Summary *(Cont'd)*

- " Some people call this (AI) but the reality is this technology will enhance us. So instead of (AI), I think we'll augment our intelligence." ." –

Ginni Rometty, CEO of IBM

Artificial Intelligence (AI) & future life…..

Agenda;

- History of industrial revolution *
- AI concept
- AI shaping daily life*
- Impact of AI on society*
- Challenges (global, regional & local)*
- Summary & proposed initiative*

* 14 Oct., 2018 Update

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

Proposed initiative

- Nation-wide Enlightenment project

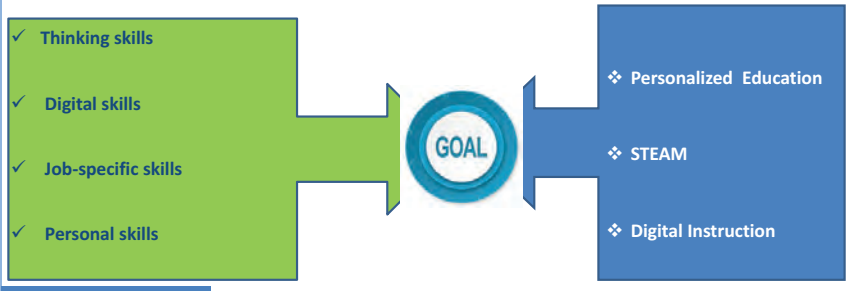
AI presentation\VR & Education.mp4

Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy

Proposed initiative* *(Cont'd)*

- ArabCCD project; (what & who?)



Arabccd Round Table
28 Feb.-1 March, 2018

Gevara Al Behairy