



# Partner Schools Global Network

**SCHOOLS NOW! CONFERENCE**

**6 March – 7 March 2018**

**Jordan, Amman**

**Innovation in Education**

**(System, School and Classroom)**

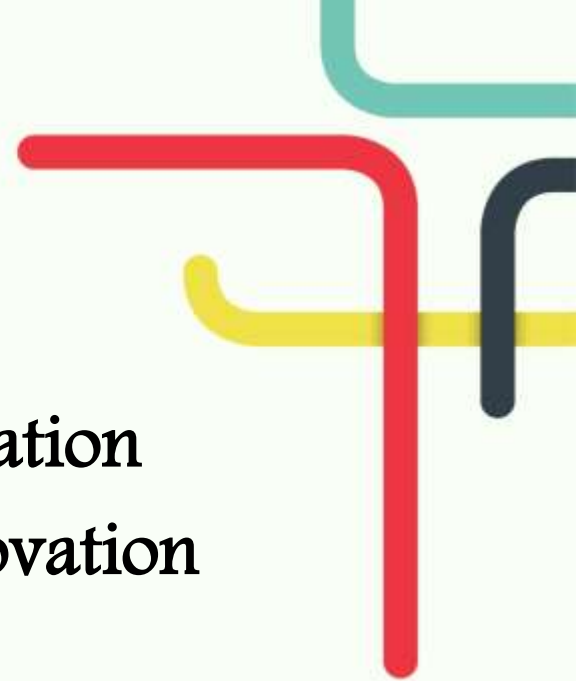
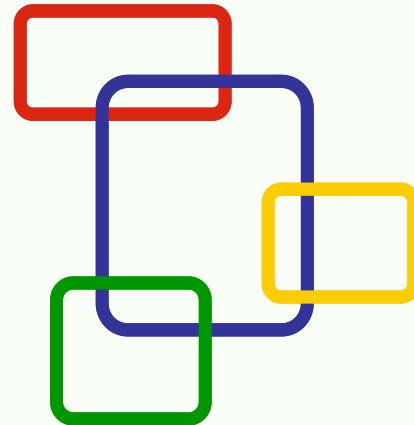


**Explore and Share  
Your Creative and Innovative Traits  
in the Classroom**

**Dr. Emad Oddtallah**



- **Innovation in education**
- **Creating a school that supports innovation**
- **Creating classrooms that support innovation**



# What are the 21st Century skills?

## Ways of thinking

1. Creativity & innovation
2. Critical thinking, problem-solving, decision-making
3. Learning to learn, metacognition

## Ways of working

4. Communication
5. Collaboration (teamwork)

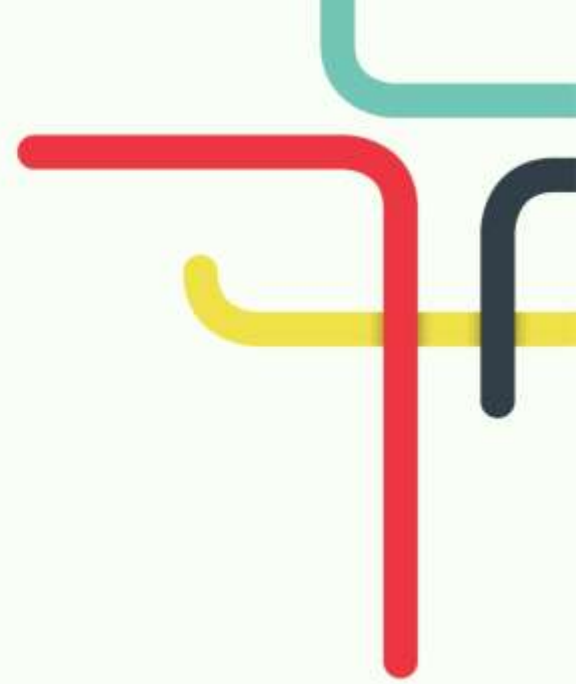


## Tools for working

6. Information literacy
7. ICT literacy

## Living in the world

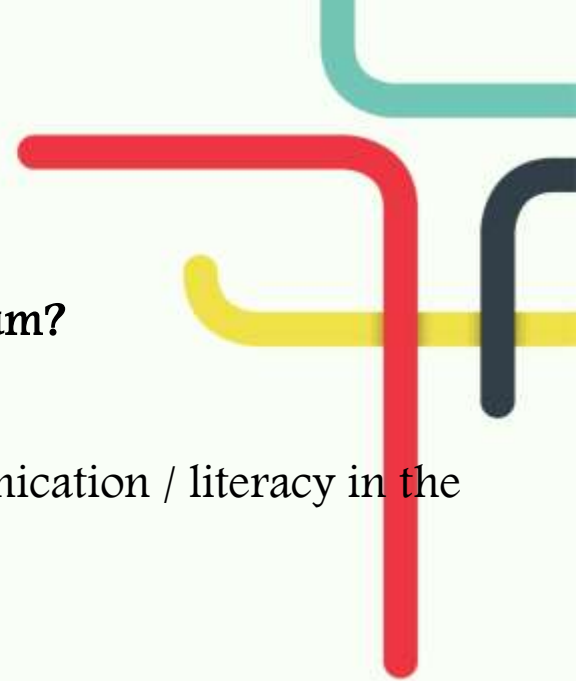
8. Citizenship – local & global
9. Life & career
10. Personal & social responsibility

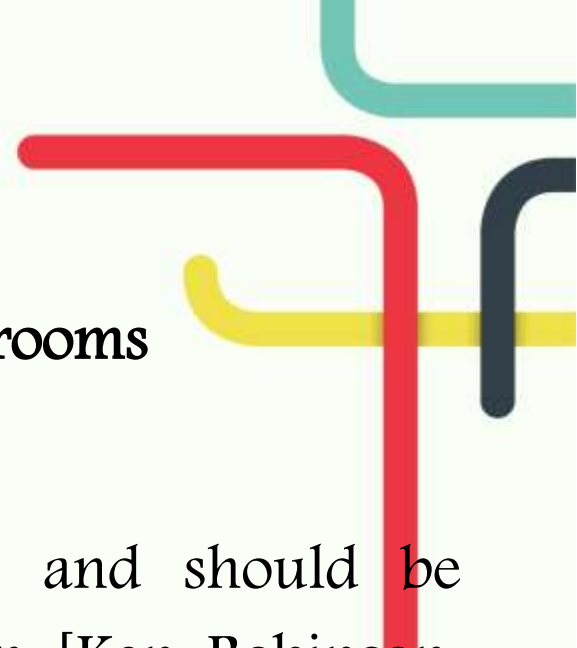


- **Do creativity and innovations have a place in the curriculum?**

A Balanced Curriculum Might be considered to include:

- Communication / literacy in the mother tongue – Communication / literacy in the language of instruction of the school
- Communication / literacy in foreign languages
- The development of Mathematical, Science and Technology competences
- Social, cultural and civic awareness and expression.
- Developing an informed sense of self in place and time starts with local.
- Developing global awareness.
- Creative, artistic, enterprise
- Physical education and sport Balance of activities as well as other subjects...



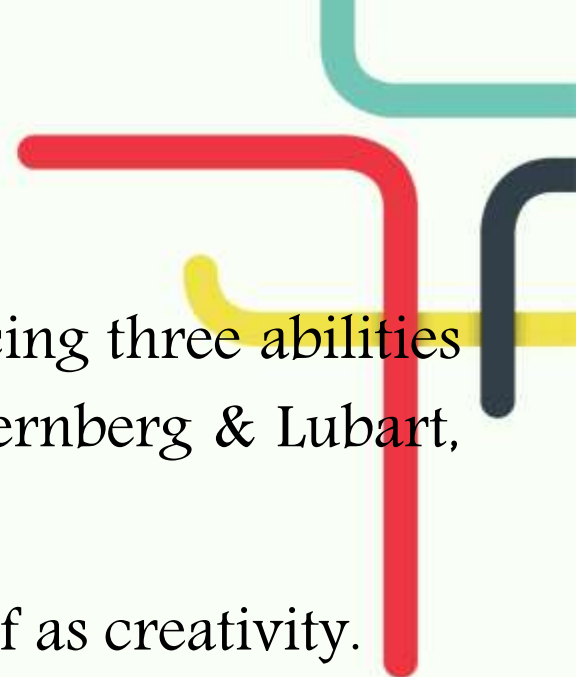
- 
- **What is it there that we can use in our classrooms to enhance teaching and learning?**
  - Creativity is possible in every discipline and should be promoted throughout the whole of education [Ken Robinson, 2011]
  - Learning to learn [including digital / information literacy] should be infused in all disciplines not a separate course  
Curriculum Coherence: The whole should be more than the sum of its parts.

- “The role of the teacher is to create the conditions for invention rather than provide ready-made knowledge.”

Seymour Papert.





- 
- Creative work requires applying and balancing three abilities that can all be developed (Sternberg 1985; Sternberg & Lubart, 1995; Sternberg & Williams, 1996).
  - **Synthetic ability** is what we typically think of as creativity.
  - **Analytic ability** is typically considered to be critical thinking ability.
  - **Practical ability** is the ability to translate theory into practice and abstract ideas into practical accomplishments.

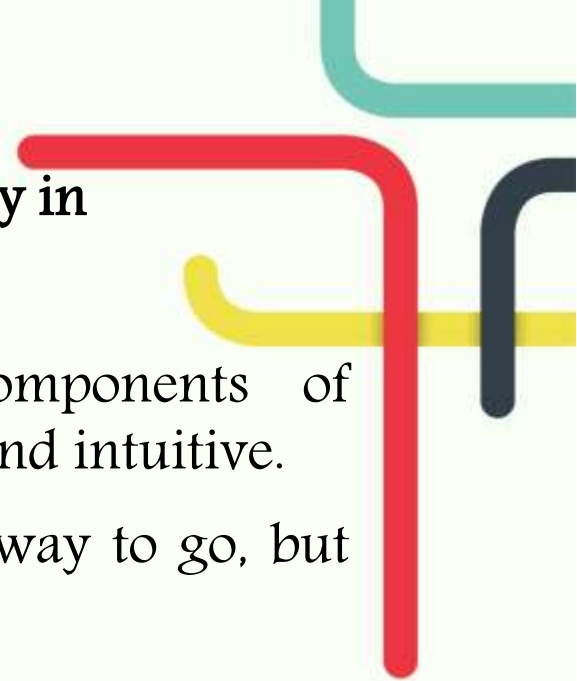
- **How can we encourage innovation and creativity in ourselves and our students?**

Reimers-Hild and King (2009) described components of innovation as fun, creative, diverse, collaborative, and intuitive.

Taking small steps to accomplish this goal is the way to go, but there needs to be support and encouragement.

Taking risks and sometimes even looking at failure as “fuel for innovation” can help promote this process (Ryshke, 2012).

If something does not work, we can learn from it, and then modify and try again. While serving as Director of a Center for Faculty Development,.





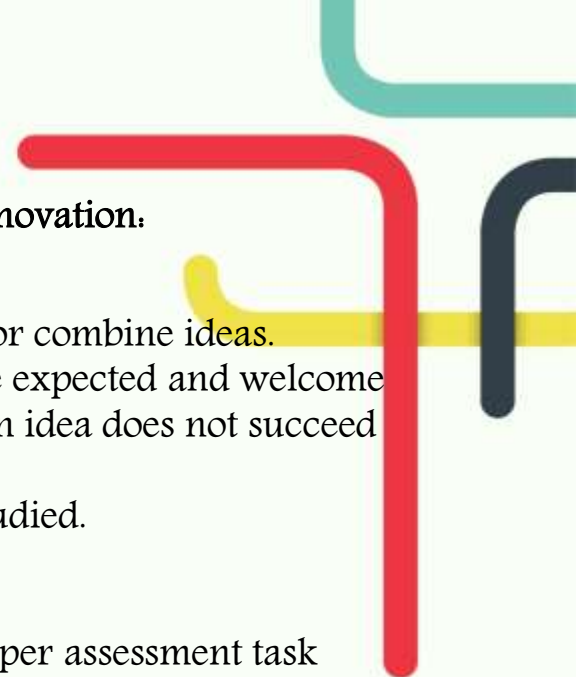
• How to encourage creativity and innovation in the classroom?

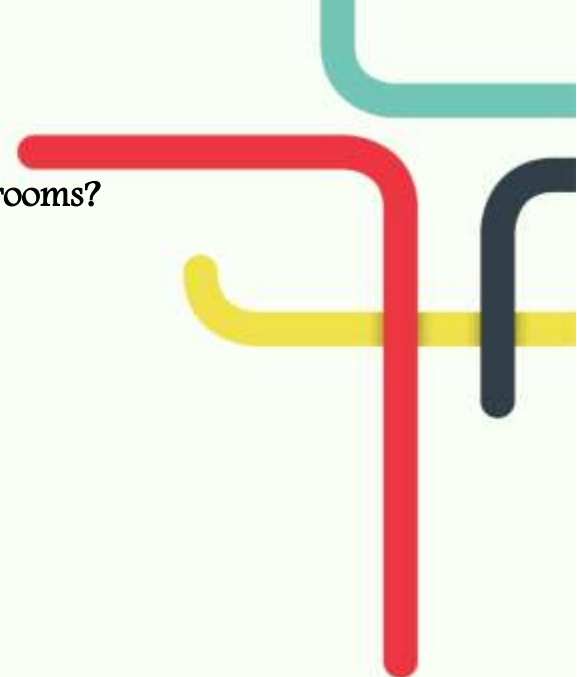
- Active Learning
- Community Building
- Collaboration
- Risk-Taking



- What are some ways you create an innovative and creative environment for yourself and your students? What do you need to help you create an environment that encourages innovation and creativity?

- Identify and capitalize on students' existing needs.
- Make students active participants in learning.
- Ask students to analyze what makes their class more or less “motivating.”
- Incorporate Instructional Behaviors That Motivate Students
- Hold high but realistic expectations for your students.
- Help students set achievable goals for themselves.
- Tell students what they need to do in order to succeed in your class.
- Strengthen students' self-motivation.
- Be enthusiastic about your subject.

- 
- **Structuring the Course to Motivate Students, increase creativity and innovation.**
    - Create a welcoming environment.
    - Modeling: Share your thinking with students; explain how you create or combine ideas.
    - Communicating expectations: Let students know that creative ideas are expected and welcome
    - Reinforcement: Applaud creative thinking, even (or especially) when an idea does not succeed
    - Work from students' strengths and interests.
      - When possible, let students have some say in choosing what will be studied.
    - Increase the difficulty of the material as the semester progresses.
    - Vary your teaching methods.
    - Choice of the right tools for the pedagogical task matched with the proper assessment task
      - Exploration of how resources are managed and how interactions are facilitated
    - A rethinking of learning activities to ensure a match between discipline, pedagogy and technologies that the teacher has chosen to create the learning task.
      - AND The opportunity for learners to design and demonstrate their understanding
    - Emphasize mastery and learning instead of grades.
    - Motivate Students by Responding to Their Work
      - Give students feedback as quickly as possible.
        - Reward success.
      - Introduce students to the good work done by their peers.
      - Be specific when giving feedback.
      - Avoid demeaning comments.

- 
- What are some ways then as educators that we foster creativity in our classrooms?
    1. Model Creativity
    2. Find Excitement
    3. Build Self-Efficacy
    4. Embrace creativity as part of learning.
    5. Use the most effective strategies.
    6. Question Assumptions
    7. Encourage Idea Generation
    8. Teach Self-Responsibility
    9. Promote Self-Regulation
    10. Allow Time for Creative Thinking
    11. Play to Strengths
    12. Think of creativity as a skill
    13. Participate in or create a program to develop creative skills
    14. Encourage Creative Collaboration
    15. Allow room for mistakes

A top-down view of a desk with a spiral notebook, a pen, a water bottle, and a tray of pens. The notebook is open and blank, with a silver spiral binding in the center. A white pen lies on the right page. In the top left corner, there is a white water bottle. In the top right corner, there is a grey tray with several circular indentations. The desk surface is a light-colored wood grain.

## Innovation & Technology to Accelerate Progress in Education

Part of Universal Civilizations Academy (UCA) mission and vision is to ensure high quality education for all and promote lifelong learning *using innovative technology*, to achieve not just universal primary schooling, but to expand universal education from early childhood to secondary school and achieve relevant learning outcomes.





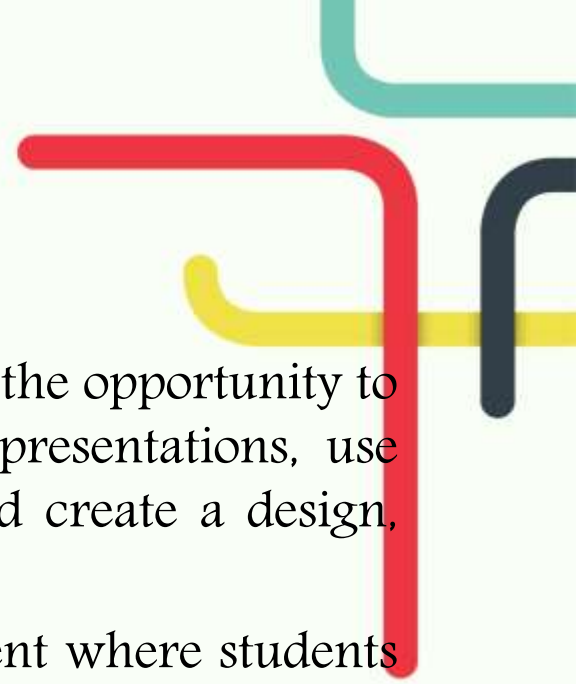
## ENGINEERING PROGRAM AT UCA

UCA has established Engineering labs where students have the opportunity to think Creatively, present their ideas in writing and in presentations, use graphical and multimedia tools in the design process and create a design, then work on building their own designs.

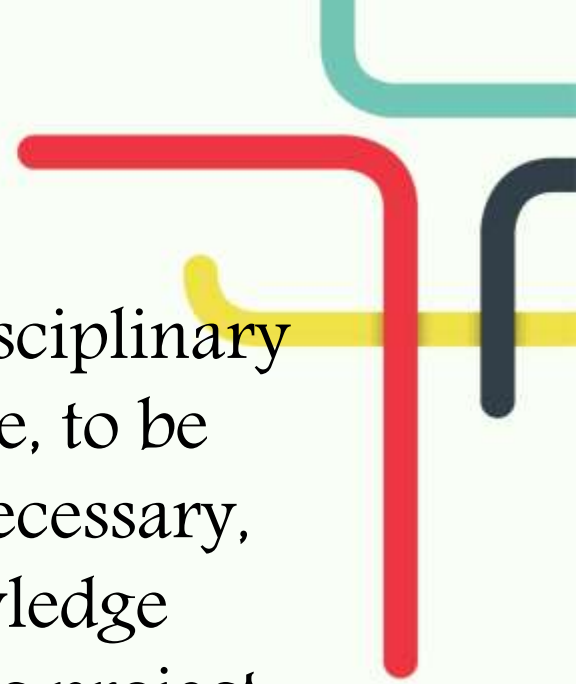
The integrated Engineering Program creates an environment where students can try their ideas.

The Program developed by UCA and Engineers provides rigorous levels of Mechatronics and Electric Engineering, 3D Design Engineering, and Robotics.

All Materials needed ( Lego, electric Circuits , boards, wires, engineering tools, 3D printers, Robots, laptops and software, ...etc are provided by the school and available in the labs.



- Engineering practice requires multidisciplinary knowledge and the abilities to evaluate, to be creative to learn what is relevant as necessary, and then to be able to apply this knowledge responsibly and efficiently in a specific project






AT UCA WE BELIEVE THAT :

Engineering and Entrepreneurship are skills can be taught at early stages , as well as they could be self-learned through Open-Sources .

Students in grades 1-3 are introduced to machines and stimulation, they build ideas , think critically, creatively and innovatively , work on projects such as Water Cooler, Fans, Motor boats, ...

In grades 4 and above , students are actively engaged in more advanced programs ( Control and Mechatronics ) witch includes six levels

- Electronic Design ( Electronic design and simulation software, sensors )
- Mechanical Design ( Mechanical Design software , 3D Printers)
- Control ( Microcontroller programming, Cell phones )
- Internet Of Things (IOT) ( controlling things through internet)
- Manufacturing ( creative ideas and to manufacture projects)
- Entrepreneurship ( Companies startup )



In grades 4 and above , students are also introduced to Architecture and Design Engineering through four levels :

- Manual Drawing
- Architectural Design
- Interior Design
- 3 D Models

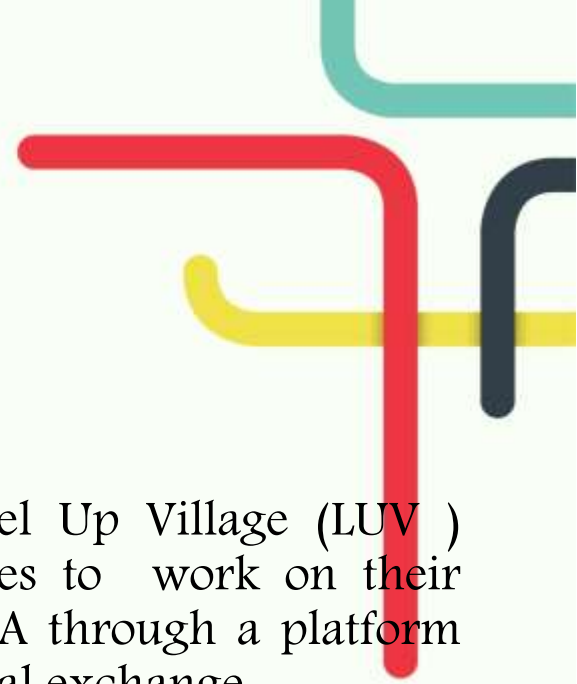
At UCA all students are actively engaged in advanced programs of Robotics which includes nine levels with focus on Structure Design and programming, Problem solving skills, Team work , creativity and innovation .

## STEAM LEARNING AT UCA

Students are encouraged through STEAM Learning; Level Up Village (LUV ) integrated program gives the students great opportunities to work on their innovative ideas in collaboration with students in the USA through a platform that facilitates one-on-one project collaboration and cultural exchange .

These programs focus on Global Competencies to develop Global Citizens, aligned to CCSS and NGSS.

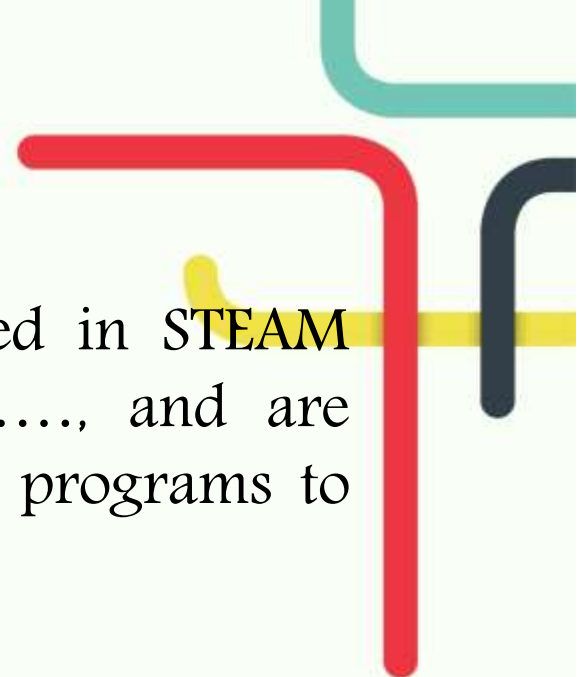
The Courses ( K- grade 10) includes ( Global programing inventor, Global Animator, Global Scientist, Global programing designer , global web designer, Global storybook engineer, global sound artists, and Global programing creators)



## LEGO AND ROBOTICS

At UCA students have opportunities to build ideas , think critically, creatively and innovatively , Lego is widely used in the school and available for grades ( k-12 students) ( We do 2, EV3) , providing lap tops and robotic programing software motivates students to creatively engage in learning process.





UCA Teachers are encouraged to be Certified in STEAM learning , programing, Lego education ....., and are always engaged in Professional Development programs to better facilitate learning.

This will help teachers :

- Initiate more active education
- Teamwork
- Enforce consistently the system
  - design build test
- Deal with conceptional issues



## ROBOTICS

Robotics technology offers a unique way to provide our students with the latest technologies.

UCA Utilizes robotics technology in KG -12 classrooms to assist early learners in math which will pay off in dividends later in their educational careers.

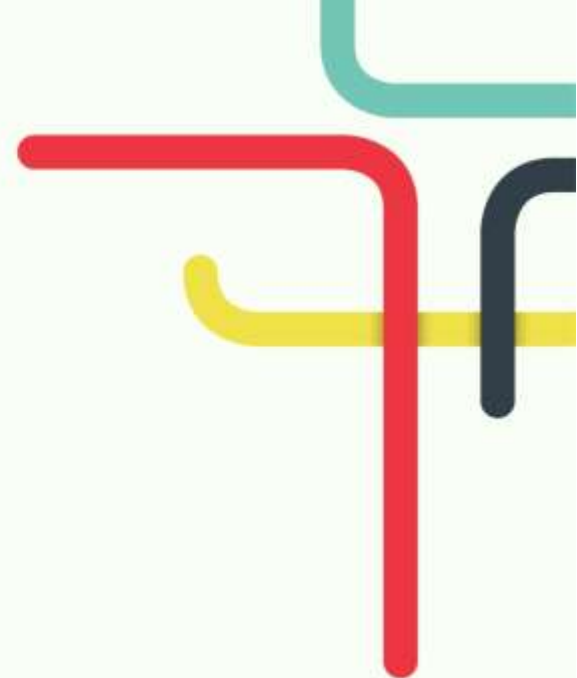
The robotics technology will ensure an advanced process in mental mathematics and will enhance cognitive development.

## BE AN ENGINEER

Throughout each academic year, students are exposed to products, engineering practices.

**Strong Communication Skills:**  
Students present their ideas in writing and in presentations, use graphical and multimedia tools in the design process and create a design notebook.

**Active Problem Analysis:**  
brainstorming, problem solving and bench marking.

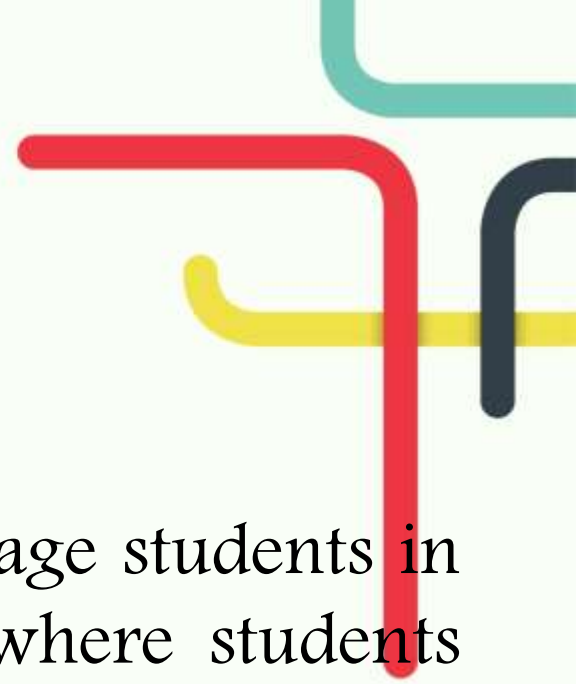




## Mental Math integrated Program

UCA has worked collaboratively to engage students in an integrated Mental Math program where students develop abilities to calculate big numbers without using pens and papers or calculators .

The Integrated program enhances high level thinking and promotes innovations.

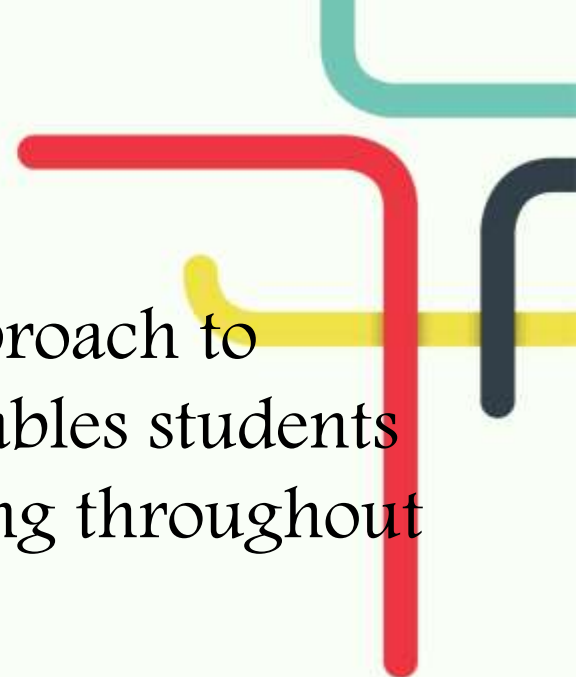


## PROJECT-BASED LEARNING AT UCA

UCA has adopted a policy of emphasizing on project based learning, all students at all stages are required to work on educational projects ( individually and collaboratively) in all subjects they study , projects should be planned for by the students with the support of the teachers.

Teachers facilitate and encourage creativity and innovation .



- 
- Project based learning is a proven approach to enhance engineering education. It enables students to act in teams as engineers-in-training throughout their programme
  - Projects can provide the driver for students to participate in inquiry-based learning
  - Facilitated student learning should be the focus – not staff lecturing



- Every organization is
- doing innovation
- ... at some level of expertise



- If you want to improve your innovation capabilities,
- you need to know where to focus your efforts.

***Thank you for your kind attention***



***Questions ??***

## References

- Hattie, J. [2009] *Visible learning: A synthesis of over 800 Meta-Analyses Relating to Achievement* Routledge. Oxford UK.  
(Mr Heng Swee Keat, Ministry of Education Work Plan Seminar, September 2013)  
Cambridge school conference –Singapore 2013.  
AdvanEd Conference – Dubai 2012
- Amabile, T. M. (1983). *The social psychology of creativity*. New York: Springer-Verlag.
- Amabile, T. M. (1996). *Creativity in context*. Boulder, CO: Westview.
- Csikszentmihalyi, M. (1988). Society, culture, and person: A systems view of creativity. In R. J. Sternberg (Ed.), *The Nature of Creativity*. New York: Cambridge University Press.
- Dewey, J. (1933). *How we think: A restatement of the relation of reflective thinking to the educative process*. Boston: Heath.
- Frensch, P.A., & Sternberg, R. J. (1989). Expertise and intelligent thinking: When is it worse to know better? In R. J. Sternberg (Ed.), *Advances in the psychology of human intelligence*. Vol. 5. Hillsdale, NJ: Lawrence Erlbaum.
- Garcia, J., & Koelling, R. A. (1966). The relation of cue to consequence in avoidance learning. *Psychonomic Science*, 4, 123-124.
- Gardner, H. (1993). *Creating minds*. New York: Basic Books.
- Gruber, H. E. (1986). The self-construction of the extraordinary. In R. J. Sternberg & J. E. Davidson (Eds.), *Conceptions of giftedness*. New York: Cambridge University Press.
- Schank, R. C. (1988). *The Creative Attitude: Learning to Ask and Answer the Right Questions*. New York: Macmillan.
- Sternberg, R. J. (1985). *Beyond IQ: A Triarchic theory of human intelligence*. New York: Cambridge University Press.
- Sternberg, R. J. (1997). *Successful intelligence*. New York: Plume.
- Sternberg, R. J. (in press). A propulsion model of types of creative contributions. *Review of General Psychology*.
- Sternberg, R. J., & Lubart, T. I. (1995). *Defying the crowd: Cultivating creativity in a culture of conformity*. New York: Free Press.
- Sternberg, R. J., & Williams, W. M. (1996). *How to develop student creativity*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Reimers-Hild & King (2009). Six questions for entrepreneurial leadership and innovations in distance education. *Online Journal of Distance Learning Administration*. Extracted from <http://www.westga.edu/~>
- Ryshke, R. (2012) What schools can do to encourage innovation. Extracted from <http://ryshke.wordpress.com/2012/02/26/what-schools-can-do-to-encourage-innovation/>
- Simmons, E. (2012) Rewarding Teaching Innovations. Extracted from <http://www.insidehighered.com/advice/2012/04/18/essay-how-colleges-can-encourage-professors-innovate-teaching>
- <http://www.opencolleges.edu.au/informed/features/30-things-you-can-do-to-promote-creativity-in-your-classroom/#ixzz2jRZSTeCz>

## Creativity and Motivation