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# Smart Education for „Smart" Concepts

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First usage of word „Smart” in context of solving structural problems is related to SMART goals.

The term was first proposed by George T. Doran in the November 1981 issue of Management Review. He suggested that goals should be SMART (specific, measurable, assignable, realistic and time-related)


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Word „Smart” in context of solving specific global challenges was first used by IBM when launched its „Smarter Cities” marketing initiative in 2008.

In 2011. already 1st Smart City Expo World Congress was held in Barcelona, in which 6000 people from 50 countries attended.


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Examples of „Smart" concepts:

- Intelligent transportation systems
- Precision agriculture
- Smart cities
- Sustainable environment
- Smart infrastructure

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## To explain Smart education and Smart concepts as example Smart cities will be used

But first, we should understand broader picture:

- 4th industrial (commercial) revolution is progressing fast
- World population is growing
- World population urbanization is progressing
- Climate changes are affecting more and more
- Lack of resources (water, energy, food, …) is growing
- …

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## Smart education

Smart education is "a model of learning adapted to new generations of digital natives."

In comparison to traditional classroom teaching models, smart education is an interactive, collaborative and visual model, designed to increase student engagement and enable teachers to adapt to students' skills, interests and learning preferences.

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# Smart education

Smart classroom technology supports the professionalization of the teaching process, supporting teachers to better prepare and enrich their lectures and to react flexibly to the needs of students and conditions in classrooms, leading to increased efficiency and better teaching performance. In this student-centric context, the teacher is no longer an authoritarian figure, but a guide, a learning companion, in what is effectively a bi-directional process.


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# Smart education & Smart Cities

Smart cities need education facilities and school systems which ensure students acquire 21st century skills, including digital literacy, inventive thinking, effective communication, teamwork and the ability to create high-quality projects.

In order to reach this lofty goal, educators need to focus technology on the key building blocks of student achievement.

**21st century skills**:

- Critical thinking
- Communication skills
- Creativity
- Problem solving
- Perseverance
- Collaboration
- Information literacy
- Technology skills and digital literacy

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IEEE Smart Cities
Institute of Electrical and Electronics Engineers
Newsletter, April 2022

# The Current Form of Education: Lacks and Demetris

In its current form, the school system—both the pedagogy and the content—was modeled to address the needs of the industrial era and the challenges of the 19th century.
This means we have had two centuries where we have tried to apply what we have as it is or remodel it as the technology advances.

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# The Current Form of Education: Lacks and Demetris

Albeit this, that is, the development of the improved version of the conventional traditional educational version during information era the improved system **does not appeal to the needs of smart cities (concepts) which advocates for a happier, advanced human being** who is free to choose and can access learning when and where he needs at a pace he can control.

Thus, the demerits which the futuristic education seeks to address are matters such as teacher-centered learning where the teacher is the super source of information, the limitation of learning space to the physical class or the school environment, limitation on the choice of content to learn and the restriction on the pace of learning among some other issues.

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# What Constitutes a Smart City?

A few years ago, **smart cities** were a futuristic idea but as we stand today, they **are a new normal.** Across the world there are sprouting smart cities with nations amassing huge budgets to fund the development of these cities.

Smart cities are urban environments that Leverages IoT and networking, sensor technologies, data analytics and computing to make the urban space interconnect and communicate with each other so as to make better use of infrastructure across the transport, energy, environmental monitoring, and spatial orientation as well as the governance structure with an ultimate aim of promoting sustainable development and **happy citizenry**.

Despite this optimistic rise in tech-based cities, the game plan will not be complete if we forget the **smart citizens** who will actually run them.

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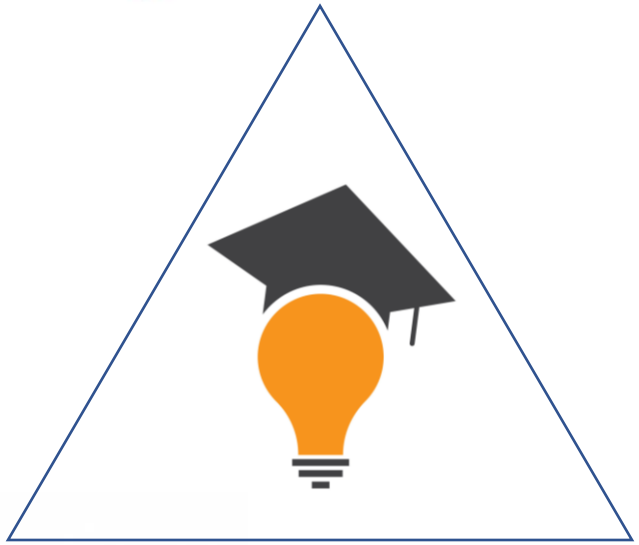
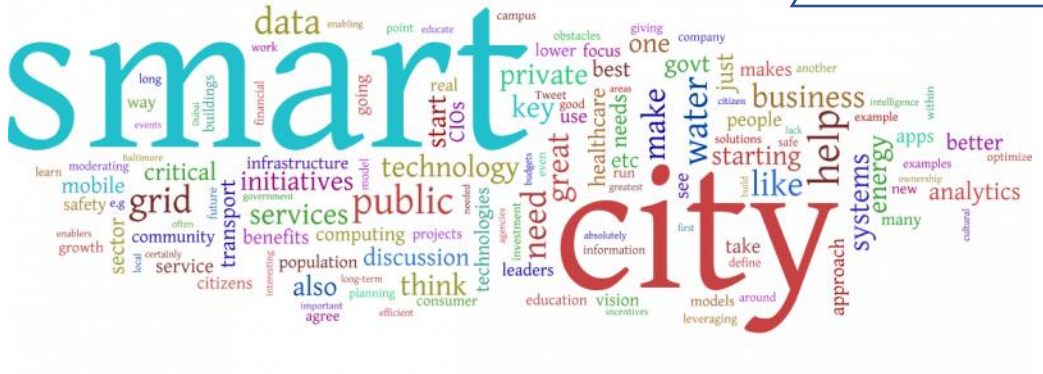
# Smart triangle:

The Smart ITIZEN







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# Affinity Areas for Smart Education

The modern/future education should be **compatible to the knowledge and technological advances needed** in the smart cities.
We need to exert a conscious **mental shift** to make learning more interesting, collaborative and oriented towards development of talents and skills which allows us to solve problems around us.
This learning should accommodate the **uniqueness of the learners** and provide more freedom in terms of pace and access to data and learning resources.
This is only possible if we orient the content being taught as well as the pedagogical methodologies to suit the new needs.

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# Collaborative Learning

Education should be decentralized such that schools should not serve as exclusive avenues for learning.
While they play a major role in streamlining the learning processes, they should provide space for the involvement of other players in commercial, parenting, governmental and civil society sectors.
Student themselves should act as source of learning to their peers. The learning programs should also encourage school-school interdisciplinary exchange programs.

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# Learner-Centered Learning

Smart education should build education system which facilitates and encourages the learners to be in control of their learning.
The learners should be self-driven and in possession of the skillset and values which enables them to control their learning journey.
In this regard, teachers will be the mentors in the journey giving directions and availing resources which will inspire the learner to appreciate the learning process and feel that their needs are being addressed.

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# Lifelong Learning

Two factors come into play here. One is that the educational system should be able to produce a learner who values education and learning and thus self-motivated and self-driven sufficiently to pursue education beyond the classroom set up.

Secondly, smart cities are tech-centric cities which grow in multiple dimensions and in a daily basis. Thus, to keep abreast with what is needed to effectively live in these cities, the citizen should be able to push self into learning new ideas continuously through the non-conventional learning avenues.

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# Varied Learning Methods

With blended learning systems, technology should be able to play a role which allows for online interaction, tests and simulation to serve the learners with different formats of the content thus making them more interesting and enjoyable.

With such a kind of open environment, the stakeholders can easily identify talents and cluster them into groups and be able to provide more refined support to match skills and most probably the career needs of the learners.

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# Smart Citizens

The ultimate goal of the smart education is producing a smart citizen who can be able to apply, manipulate and propagate whatever the circuitry, data and skills required to live in, run and sustain the smart cities.

For sustainability purposes, the citizen living in a smart city should be one who appreciates the complexities involved in this kind of urban setups and be willing as well to actively contribute in encoding, decoding and loading signals to the systems so at to enable the various data analytics professionals and computing devices to study the algorithms and thus make a consistent decision in the urbanization journey of a smart city and thus improving on the services of the city and quality of life in general.

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# So, where are we with Smart Education?

Few examples:

- Looking on Masters Degrees (findamasters.com) there are allready 113 Smart, sustainable, resilient, green cities such study programmes

https://smartcities.usal.es/sites/default/files/smart-cities-intro-en.mp4

**MJ2685 Smart Cities and Climate Mitigation Strategies- Project Based 7.5 credits**



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# Stakeholder roles in Smart Learning Education

- **Learner**

The learner becomes an active leader instead of a passive follower.

- **Teacher**

Rather than being a teacher, faculty focus on being mentors and coaches. This requires training to do well in a learner-centered framework.

- **Faculty**

Becomes facilitator of students self-learning process, coordinates all stakeholders involved in the process

- **Curriculum**

The curriculum changes better reflect how the form and delivery of knowledge evolve

- **Learning Environment**

Mobility has become the norm, which has made mobile learning much more possible

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# Problems and Obstacles in the Way of Smart Educationa

Most of the time, people don't like change. Smart learning is still in its early stages, so it faces many of the same problems.
The biggest problem is that smart learning goes against traditional education.
Institutions focus more on managing people, buildings, and money than on managing learning.
Smart learning is a way to solve many problems for both the academic world and the general public. For this solution to work, we have to change how we think about learning.
Accept that traditional education can't keep up with the changing world. We need to change how higher education as a whole works to make it more helpful for today's students.

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# Conclusion

The major change in all levels of education caused by 4th industrial revolution is in front of us!

Transition to Smart education is still under development.

Planning, development and management of Smart cities and other Smart concepts as most complex process require Smart education to provide experts and prepare smart citizens.

There are already many courses and study programs about smart cities and related topics.

Smart education change roles of all stakeholders in educational process.

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# Thank you for your attention!

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