

Disruption, Globalization and the Changing Context of Education

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Education is the process of facilitating learning, acquisition of knowledge, skills, values, beliefs and habits. It is expected to prepare students for facing challenges of life. And higher education in particular is the process of molding oneself to be suitable for a career in specialized area of interest. It is clear that education offered should depend on the individuals undergoing education and the need posed by the world. Both the “individuals” and the “need” are changing with time and hence the process of education also should be changing with time, else it will become outdated and useless.

All educators need to be up-to-date and to keep pace with the changing world and the increasing demand. This is a challenging task.

UNDERSTANDING STUDENTS

Over the decades, individuals are categorized as Veterans, Boomers, Generation-X, Generation-Y (the so called millennials) and Generation-Z who are currently doing higher education. All these categories of people who lived in various time span starting from 1945 until today, have been identified to be different in terms of personality types, psychological traits, learning styles, expectations, cognitive patterns, and so on. The Generation-Z who are in higher education now are found to be entirely different compared to the other earlier generations.

Generation-Z students are highly tech savvy, impatient, good in multitasking, connected to people through the internet most of the time, pretty independent, expect quick and noticeable results and growth, self-starters, have different value system and do not believe in standard practice. In the context of education, Generation-Y do not like to read hard copy books, find it difficult to sit for hours and listen to lectures, enjoy learning outside class room, prefer learning by doing compared to learning through listening and reading, attempt to turn hobbies into jobs and love to see flexibility in the education system.

For education, to be effective the “entry behavior” of the students has to be analyzed and understood properly. The academic processes have to be carefully designed to suit the entry behavior and learning styles of the students. It calls for student-centered approach, paradigm shift in pedagogy. It has to be understood that if the process does not match the liking of the student, then learning will not happen.

NEEDS OF THE WORLD

Having analyzed the individuals (students) in the education system, it is necessary to know the existing need / expectation of the world. As we know, the world is also changing rapidly. Technological developments have forced the world to change for the better. The focus is changing, the processes and the speed of operations are changing. In this era of IT automation, borderless operations, virtual mode of functioning, disruptions and cyber physical systems have become the order of the day.

The world is being referred as the “GLOBAL VILLAGE”. Difference in time and space (distance) no longer become a constraint. Information flow across the globe happens in large, unimaginable quantities and at very high speed. Resource crunch is noticed everywhere, environment has become an issue as never before, competition has become fierce, rapid increase in entropy (disturbances) is being experienced and human rights issues are in the forefront. Because of this change in the world, the skill level, competency level and cognitive capacity are also changing. Though study on the needs of the present day world that have to be met by the education, has to be done and clearly understood by all the stakeholders of education.

For sustainable livelihood of human beings, economics is critical and for that, industrial growth is the panacea. Hence, the education system should make sure that in addition to molding the students to be good human beings in a larger overall perception, they all need to be developed to be job ready by the education institutions. This requires a different approach. World over, the gap in skill sets of the students coming out of institutions is being talked about. Identifying the skill sets and incorporating them in the curriculum is an urgent need.

In essence, undertaking the students and the need around the world and providing the education to the students all the needed contents in a way that they will appreciate is the key.

It is found that for this world of 21st century, an higher education system with the following 20 students learning objectives (SLOs) will pave way for students to be ready for the 2020 international market demands. This will ensure zero un-employment in the globe and faster economic growth.

The identified SLOs are:

- 1. Have an ability to apply mathematics and science in engineering applications*
- 2. Have a clear understanding of the subject related concepts and of contemporary issues*
- 3. Have an ability to be socially intelligent with good SIQ (Social Intelligence Quotient) and EQ (Emotional Quotient)*
- 4. Have Sense-Making Skills of creating unique insights in what is being seen or observed (Higher level thinking skills which cannot be codified)*
- 5. Have design thinking capability*
- 6. Have an ability to design a component or a product applying all the relevant standards and with realistic constraints*
- 7. Have computational thinking (Ability to translate vast data in to abstract concepts and to understand database reasoning)*
- 8. Have Virtual Collaborating ability*
- 9. Have problem solving ability- solving social issues and engineering problems*
- 10. Have a clear understanding of professional and ethical responsibility*

11. *Have interest in lifelong learning*
12. *Have adaptive thinking and adaptability*
13. *Have cross cultural competency exhibited by working in teams*
14. *Have an ability to design and conduct experiments, as well as to analyze and interpret data*
15. *Have an ability to use the social media effectively for productive use*
16. *Have a good working knowledge of communicating in English*
17. *Have an ability to use techniques, skills and modern engineering tools necessary for engineering practice*
18. *Have critical thinking and innovative skills*
19. *Have a good cognitive load management [discriminate and filter the available data] skills*
20. *Have a good digital footprint*

DISRUPTION AS APPLICABLE TO EDUCATION

Innovation and disruption are the two buzz words of the industry today. These two terms are to be understood in the correct perspective. Disruption in industry context means developing a new product that will outsmart all the other competitive products which are in the market and make the survival difficult for the competitors. An example is the business model of Jio in India. The new product and the business model that Reliance has now in its Telecom sector has disrupted all their competitors and we see them struggling.

In the same way paper back printers, post offices, camera manufactures like Canon, radio, copiers and so on, have been disrupted by new products, disruptive products that have come in to the market recently.

In education, this phenomenon of disruption in its true sense, cannot be practiced/applied; rather it should not be. There should not be any competition in education like in the industry sector, where people work on win-lose mode. Among educational institutions, there should be collaboration, co-operation for mutual benefit and should go in for only win-win strategy. Education is an industry but should not become a business. It is an industry with social objective and not with profit motive like in an industry. Hence, educational institutions should collaborate with each other and grow mutually, making sure that the institutions are not disrupted. However, “disruption” in education is still needed. Disrupting the outdated, ineffective academic processes with new processes. And letting others also to use it for mutual growth is a good option, to bring win-win culture.

The other aspect of disruption in education is using disruptive products / technologies that are in the market. These are the latest and are disruptive as they have outsmarted their competitors. The advantage of these may be in terms of cost, time, efficiency, effectiveness, and so on. The use of disruptive technologies in education will constantly improve the effectiveness of education imparted.

“Disruptive Product” or “Disruptive Technology” can emerge only through innovation. The institutions should create innovate ambience in the campus, having a risk taking culture with an open mind. This in addition to adding value to the academic process, will also make every student to be innovative and make a mark in their workplace.

In the current context of globalization and high technology intrusion, if institutions do not have digitized innovative campus with maximum use of “Disruptive” technologies, then the institutions will be rejected by the stakeholders.

DISRUPTIVE TECHNOLOGIES IN VIT UNIVERSITY

In the process of preparing the students to face the challenges of 2020 international market place, the following innovations, disruptive technologies have been used for value addition.

- Hackathon / Makeathon / Codeathon / Designathon, minimum 24 hours nonstop events outside classroom, conducted with industry participation, with well-defined learning outcomes as a part of curriculum.
- Two to three hours of lecture (1 module) in every subject being handled by experts from industries in the classroom. This is reflected in the syllabus itself.
- Every student has to undergo a course on “Lean Startup Management”, thus equipping them to become an employer.
- Fully Flexible Credit System (FFCS) in which Students can chose the number of credits to study in a semester, subjects, teachers, time slots and frame their own time table.
- TARP (Technical Answers to Real-world Problems) – A Core Course is introduced to all the students which includes, going to a village to identify existing problems in the village and work on feasible solution and prepare an implementation report, thus improving the social quotient.
- Soft Skills training which has been identified as a missing entity in education by most of the industries, has been integrated in the curriculum.
- Testing of Higher Order Thinking Skills HOTS has been introduced in evaluation (in all assignments, tests and final examination) to develop thinking skill of all the students, to become good in problem solving.
- In order to make mathematics learning, interesting and effective it is being taught in laboratory using MAT LAB software.
- Laboratories in niche areas (3D printing, wearable technology, cyber physical system, IoT, Laser based surveying, Bio-inspired design, and so on) have been introduced to the first year students.
- As the UG students are young and also highly creative, they are motivated to engage themselves in research along with a professor and they get credits in academics for the output produced.
- Exam in Digital Tablets & storing in Cloud: Students write the exams in DIGITAL TABLETS with ELECTRONIC PEN instead of on a paper. On completion, it is stored in the CLOUD and professors will pull it from the CLOUD to their laptop for evaluation.
- Virtual Classroom: Professors get connected to all their class students 24/7 using software packages such as BIG BLUE BUTTON. Few of the classes are conducted remotely in the virtual mode and when required.

- Virtual Lab: Some of the laboratories involving simulation, and programming are being conducted in virtual mode. Students will do the experiments from anywhere in the campus, with monitoring. This prepares the students for the virtual world.
- Digital Footprint: All students are motivated to engage in DIGITAL ACTIVITIES like developing apps, and document them and have their digital footprint ready, as the industries are looking for such initiatives.
- Virtual Conferences: VIT conducts Virtual International Conferences every semester with 2 or 3 Universities abroad. This saves energy spent, money and time.
- Now we are working on CBL, competency based learning methodology, which will be unique.

In conclusion, it is suggested that all the educational institutions become digital, use disruptive technologies and think global to add value to students.

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