

Work Load Participation Index Form

for

Assignments & Project(s)

(To be Submitted/Attached with Every Assignment and Phases of Project)

(Date of Submission): April 10th 2020

Artifact/Document Type (e.g. Exam/Assignment #1/#2/#3, Project Phase 1/2): Assignment 3
Participation in his/her allocated task's completion

5= Full (as allocated) 4= Partial (slightly less) 3=Half (as allocated) 2/1=Little 0= No Participation

<i>Student Number</i>	<i>Student Name</i>	<i>Participation Index Value e.g. 5/4/3/2/1</i>	<i>Signature</i>
040946430	Thang Nguyen	5	Thang Nguyen
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Due to the current social distancing problem, we cannot get everyone's signature. All participation proof can be obtained from group leader.

*The **Project Leader** for this Group is: Thang Nguyen*

Signatures of Team/Project Leader: Thang Nguyen
Team Number/Name (if any) _____

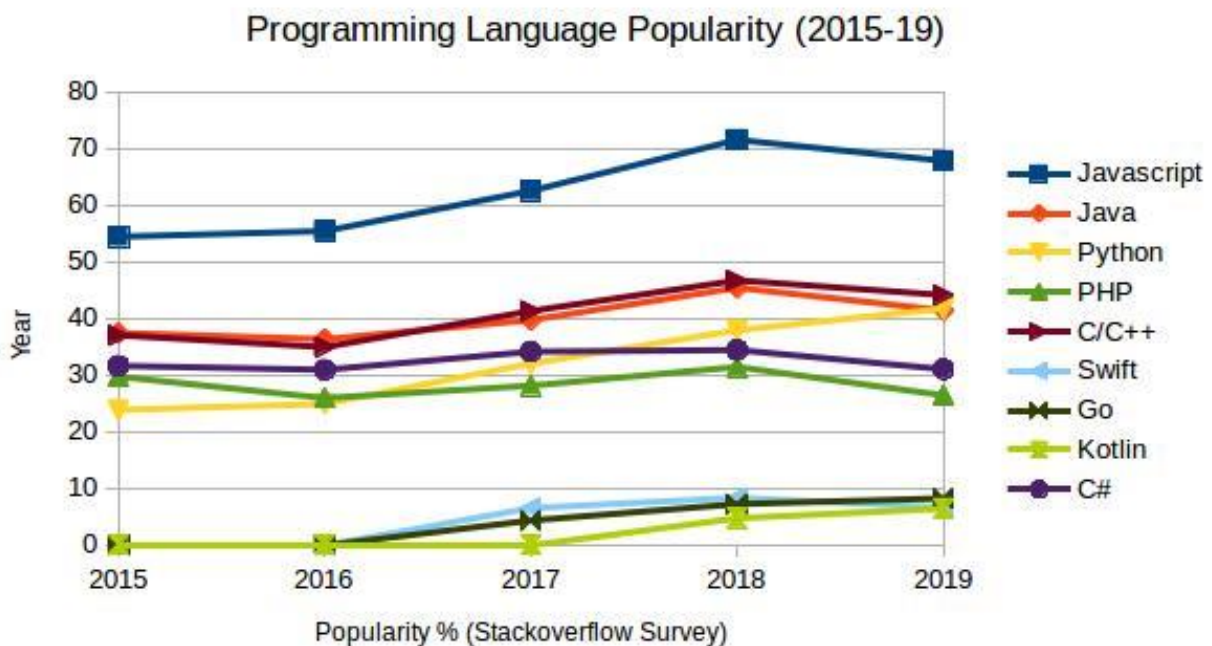
Note: *Team leader please briefly describe below if any group member(s) is/are not participating properly to justify learning and workload participation in the located task(s).*

CST2234 - 303 - Assignment #3

Algonquin College

1. Explore and explain the concept of Emerging Technologies.

Emerging technologies are technologies that are currently prone to become trendy, but they are not utilized or used by the majority of people at the current moment. These kinds of technology are usually new, and they are often perceived as capable of changing the whole culture revolving around the industry or category of that technology. This can be largely seen in the tech culture where new technology frameworks and languages come out in almost every two or three years. Considering the picture below where GitHub visualizes how programming languages trend change over time.

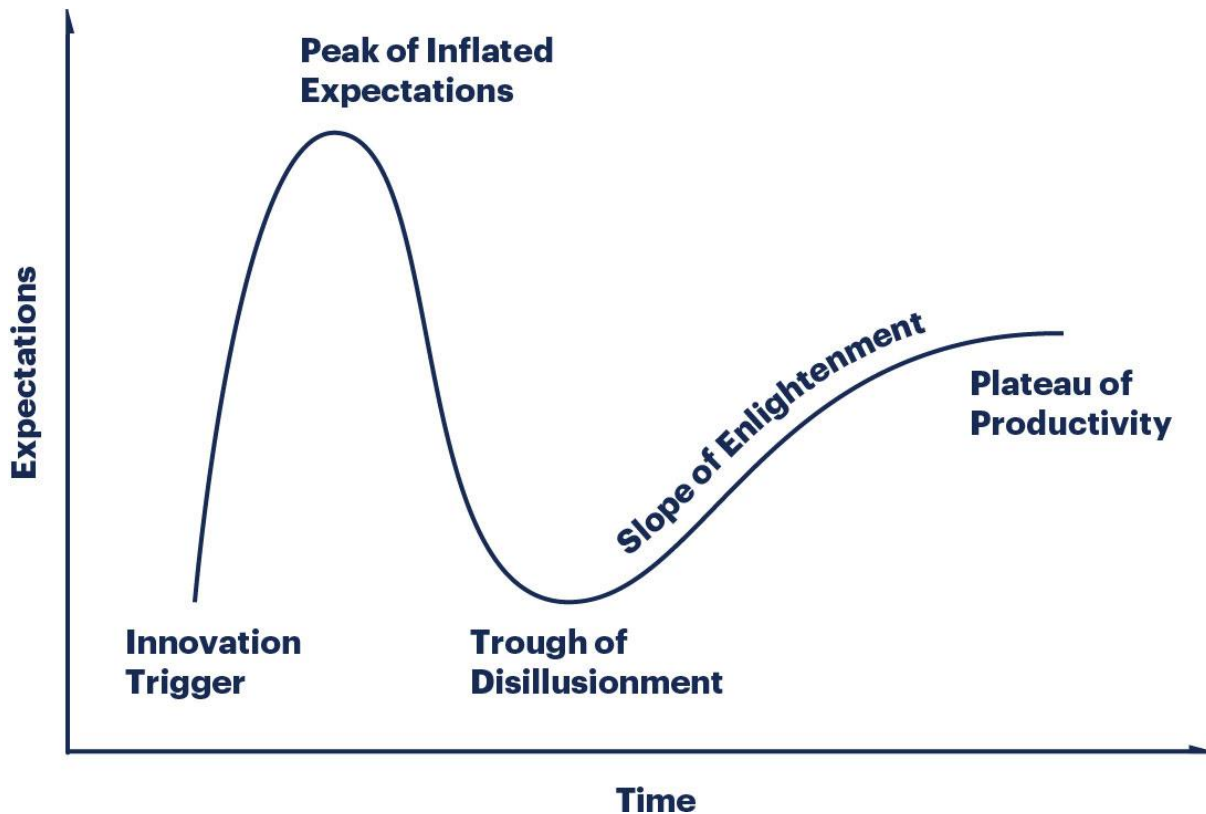


Programming Languages Popularity over time [1]

You can see there are multiple shifts in programming language paradigms from the year 2015 to 2019, and the most notable of them is the Python language which has dramatic increase in popularity in an only short time span of four years. The reason for such change in emerging technologies and trends may include many unprecedented reasons, and some of the primary reasons are:

- Increasing consumer expectation for technology products that require more modern and robust backend technology
- Change in developers' taste for ideal programming languages and technologies along with the horde effect
- Technologies creators or maintainers declare legacy state for their products which force other programmers or creators to switch to other technologies.

Emerging technologies and trends also bring a lot of hype to enthusiastic fans and developers around the world which can facilitate the rising speed of such technologies on media. With the growing speed of how information can be passed and mutated between people and news providers, the hype of new technologies can gain drastic popularity and create a common graphical presentation of this phenomenon: Gartner Hype Cycle. Consider the cycle chart below:



Hype Gartner Cycle Chart [2]

The Gartner Hype Cycle chart above provides us a realistic expectation of how technology adopters expect a new technological trend over time and gives us better insight into the concept of emerging technologies.

2) Identify and explain different Types of Emerging Technologies.

There are many different types of emerging technologies out there that shape our technology culture and the world of how we see it today. There are new trends in technologies that provides students with better cognitive and logic processing skills in education field. There are also emerging technologies in the medical field that can help save critical lives that are on the brink of death. The number of different types of emerging technologies is endless, and they all exist in order to make life better for all beings:

a) Educational Emerging Technology

Explain: Educational Emerging Technologies are technologies that usually help people around the world gain more access to educational resources through online resources including forums, online course portal with 24/7 material access, and many more. These technologies can also include the use of hardware and software to boost student learning performance by making good use of modern technologies such as AR, VR, or eText learning. There are also emerging educational technologies that are built on top of traditional technologies such as web application ones like Kahoot.it that makes learning a more pleasant experience for both students and teachers.

A GAME-BASED CLASSROOM RESPONSE SYSTEM

FOR SCHOOLS, UNIVERSITIES, & BUSINESSES



ASK THOUGHT PROVOKING QUESTIONS

Which motivate participation through game-based learning and rewards in a social setting.



STUDENTS, TAKE CONTROL OF YOUR OWN LEARNING

Through research and creation you inquire with meaningful questions, turning you in to a leader.

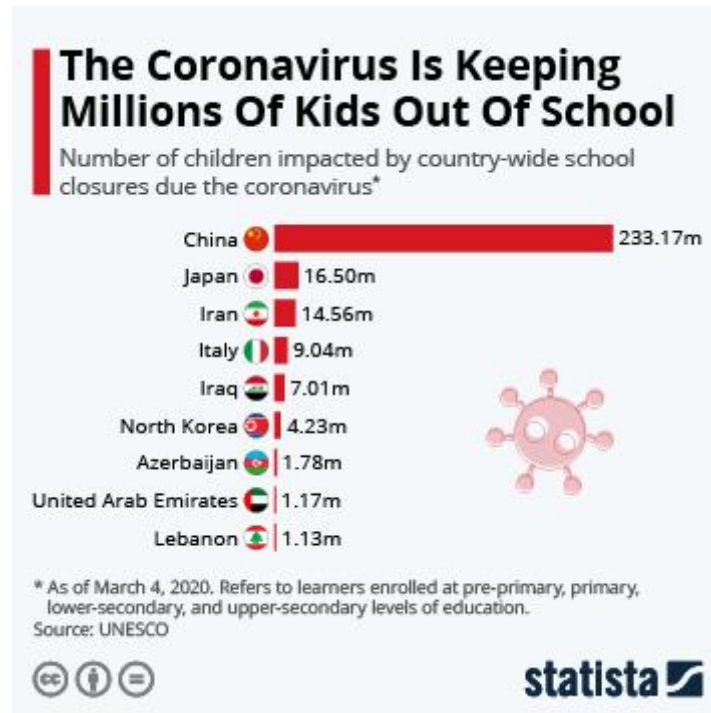


EASY-TO-USE, INCLUSIVE & HIGHLY ENGAGING

Backed by academic research in blended learning. Using technology in your classroom will never be the same again.

Kahoot Effects on Learning Behaviors [3]

How it helps us in achieving innovative solutions to our problems: With this type of technology, teachers around the world have been able to solve many critical problems by using many out-of-the-box innovative solutions. Some of the problems that are solved include: bringing classes online during a virus pandemic, reducing the hassle of grading multiple choice questions by online grading, providing live announcement to all students without physical attendance, any many more. Consider the statistic below:

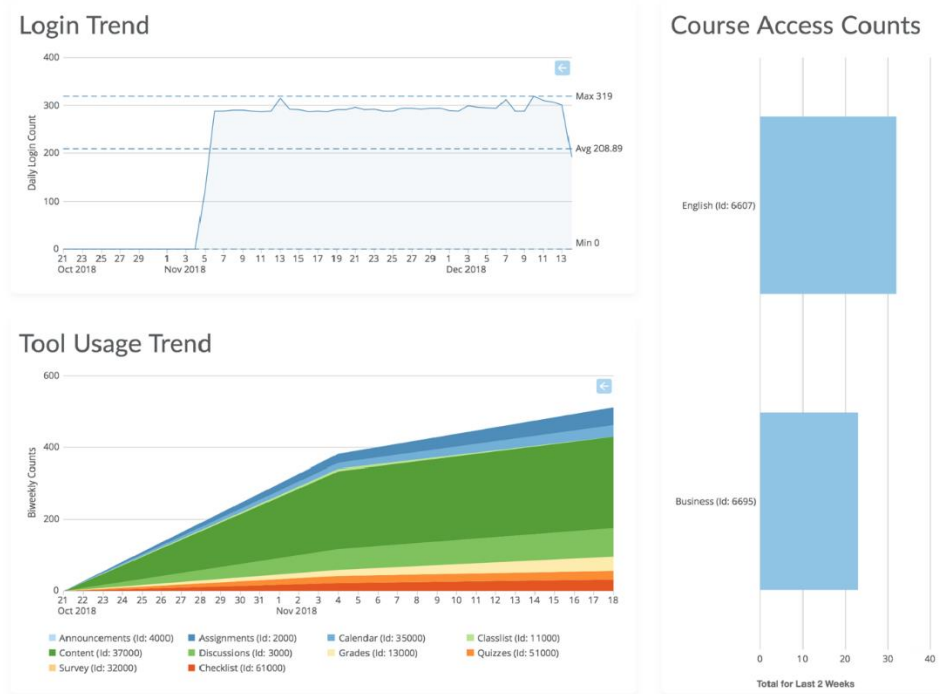


Statistics of children that are kept out of school due to COVID-19 [12]

Without such innovation breakthrough in recent educational technology, millions of kids would have been kept out of school across the world due to the ongoing cases of the COVID-19 virus.

The most prime example for this type of technology is the rising adoption of BrightSpace by many prestigious universities and colleges around the world. BrightSpace allows teachers to manage their class, upload their class material and grade student assignments online which make course material and knowledge more accessible than ever. Not stopping there, D2L (the company behind BrightSpace) also provides BrightSpace a community forum which allows professors and teachers from schools around the world share their tips and tricks on how to make BrightSpace have better experience for the students. BrightSpace also comes with analytic technologies that can analyze learning behavior of students and allow teachers to reassess their teaching methods for better result output. Consider the sample analytic tool by BrightSpace below:

Adoption



BrightSpace Adoption Analytics Dashboard [5]

The analytic dashboard clearly shows the in-depth student interaction statistics with online course materials, and it is a game changer tool for many teaching faculties that are in need of education quality measurement tool. BrightSpace is a prime example of an educational emerging technology that solve many of our existing problems in education using innovative solutions by teacher and professors across the world.

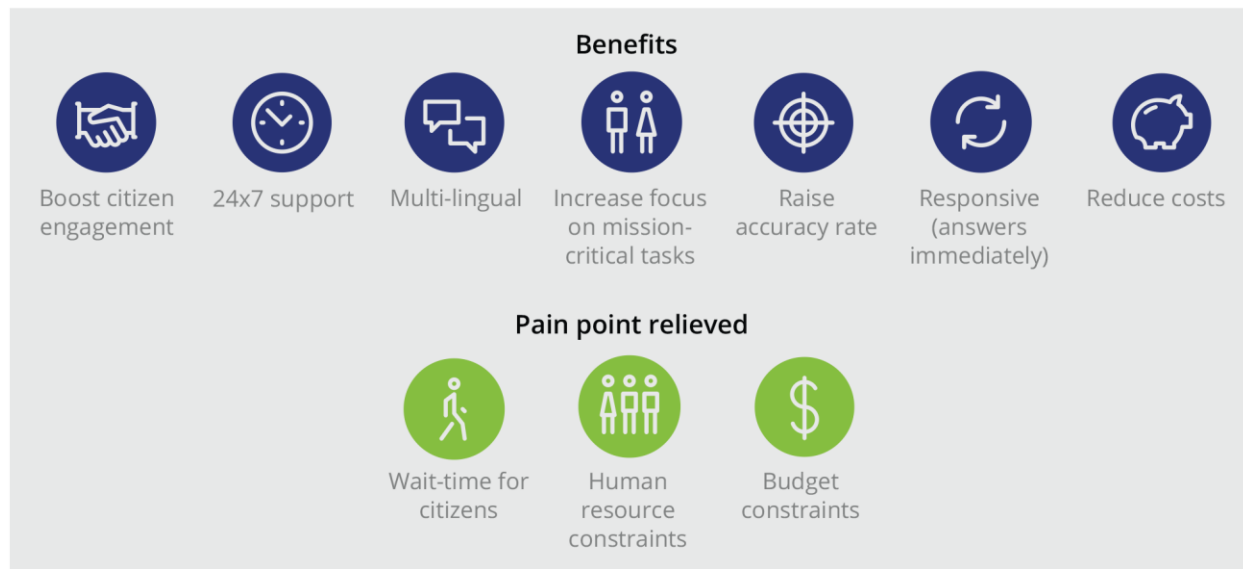
b) Cognitive Science Emerging Technologies

Explain: According to Stanford Encyclopedia of Philosophy, Cognitive Science emerging technologies are technologies that involves scientific study of “mind and intelligence, embracing philosophy, psychology, artificial intelligence, neuroscience, linguistics, and anthropology”. This technology origins are in “the mid-1950s when researchers in several fields began to develop theories of mind based on complex representations and computational procedures” [6]. Many of human complicated nature features are deeply studied including language, perception, memory, attention, reasoning, and emotion.

The fundamental concept of cognitive science is that “thinking can best be understood in terms of representational structures in the mind and computational procedures that operate on those structures” [6]. Cognitive Science studies are the main contributing factors to the drastic growing speed of Article Intelligence and Deep Learning technologies that enhance many daily logic

processing tasks such as language translating or news filtering. Some of extra benefits can be seen in the diagram below drawn by Deloitte:

Figure 3. Benefits of cognitive engagement applications



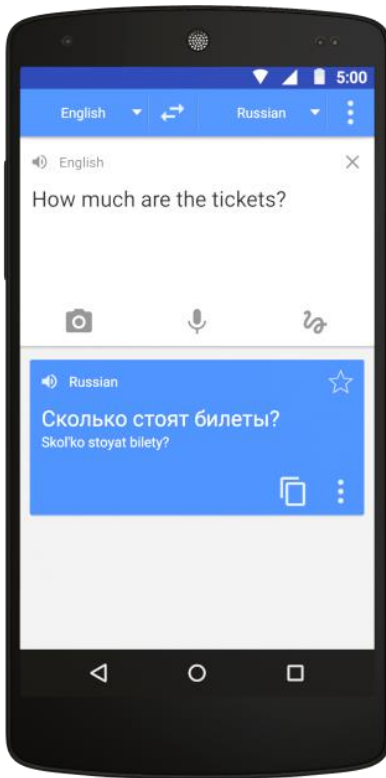
Source: Deloitte analysis.

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Benefits of Emerging Cognitive Technologies [7]

How it helps us in achieving innovative solutions to our problems: Cognitive Science emerging technologies help us solve problems that needs machinery accuracy in human cognitive tasks. Some common tasks can include picking the best price for an item, perceiving and translating foreign languages, augmenting human vision using AI, or it can be simple as providing digital smells for people with disabled smelling sense.

The most prime example of all the emerging cognitive technologies is the rising adoption of Google Translate for foreign speakers and travelers. Google Translate provides the utmost quick and accurate translation of other languages using a complicated combination of Artificial Intelligence, Natural Language Processing, and Voice Recognition technologies. With the dedicated engineering process by Google and the growing userbase worldwide, Google Translate has solved our current internationalization problem by enabling translation for people having no access to foreign language education or facilities. Providing translation can be as quick as tapping a button on your phone and say what you need to translate to the person on the other end



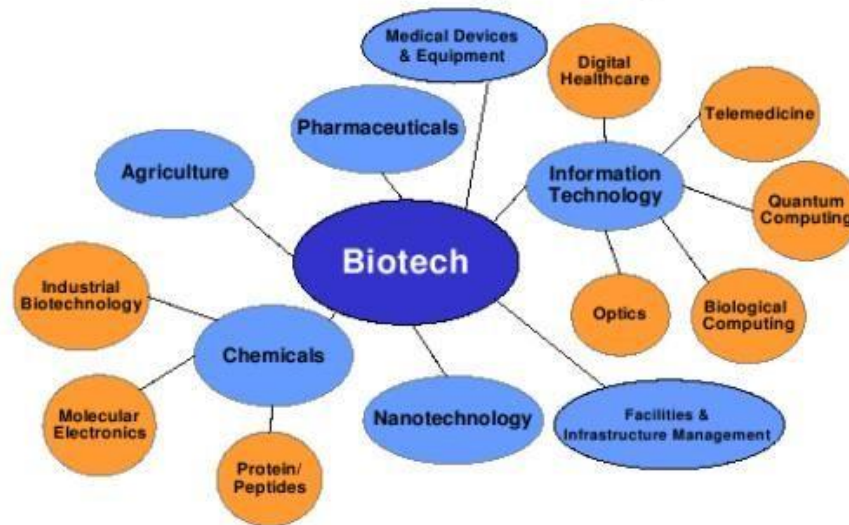
Google Translate Intuitive UX [8]

c) Emerging Biotechnologies

Explain: At its simplest form, emerging biotechnologies are technologies “based on biology - biotechnology harnesses cellular and biomolecular processes to develop technologies and products that help improve our lives and the health of our planet” [9]. Biotechnologies make good use “biological processes of microorganisms to make useful food products, such as bread and cheese, and to preserve dairy products” [9].

Biotechnologies can also include the use of biological processes such as “fermentation and harnesses biocatalysts such as enzymes, yeast, and other microbes” to provide many microscopic manufacturing plants that yields high quality food production that we consume daily. Aside from being the corner stone in the food production industry, some of the other emerging biotechnology trends include: Exosomes in Cancer Nanomedicine and Immunotherapy, Cell Therapies and Regenerative Medicine, or Neuroscience [9]. Emerging biotechnologies can include many subsets of the fields, and it is important to keep in mind the subtle difference between those subsets as visualized in the diagram below:

The Biotechnology Industry



Subsets of emerging biotechnologies [10]

How it helps us in achieving innovative solutions to our problems: Emerging biotechnologies solve the problems of overloaded healthcare systems by enhancing the healing process for patients across the world. According to bio.com, the most primary problems they can solve include [9]:

- Reducing rates of infectious disease;
- Saving millions of children's lives;
- Changing the odds of serious, life-threatening conditions affecting millions around the world;
- Tailoring treatments to individuals to minimize health risks and side effects;
- Creating more precise tools for disease detection;
- Combating serious illnesses and everyday threats confronting the developing world.

The most stable example of the emerging biotechnologies is the cell therapies and regenerative Medicine technology which can provides breakthrough in healthcare by making use of “cells, biomaterials, and molecules to fix structures in the body that do not function properly due to disease or injury” [11]. It is one of the most potential techniques worldwide for repairing damaged or destroyed tissues, and their targets of treatment can include [11]:

- Hormonal dysfunction, such as diabetes and growth hormone deficiency
- Neurodegenerative diseases, such as Parkinson's, Alzheimer's and Huntington's
- Cardiovascular lesions, such as myocardial infarction, peripheral vascular ischaemia
- Lesions in the cornea, skeletal muscle, skin, joints and bones etc.

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