

Making Lifelong Learning Reality For Everyone

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ABSTRACT

UPDATED—11 December 2017. This paper establishes why lifelong learning is an economic imperative, what are the motivations and outcomes for people pursuing lifelong learning, what barriers exist to lifelong learning, what are the most effective learning styles of well-known lifelong learners such as Elon Musk, what existing solutions are available, to provide a set of recommendations for a digital lifelong learning platform which can be used by everyone. It is not sufficient to have the right digital technology platform for lifelong learning, the effectiveness of learning also depends on the individuals, whether one has growth mindset, is curious and whether they have a deliberate style of learning, are autodidacts or self-learners. Research shows everyone is a lifelong learner, as we are all learning all the time and we need to provide a platform which is affordable, easy to use and democratized to be accessible to all segments including underserved population in the world.

Author Keywords

lifelong learning; motivation; barriers; learning styles, autodidacts, learning style, digital learning platform

ACM Classification Keywords

Applied computing~Interactive learning environments

INTRODUCTION

Lifelong learning is becoming an economic imperative [1], attributed to rapid technological changes, which demands a stronger and more continuous connection between education and future employment. In many occupations, it has become essential to acquire new skills as established ones become obsolete. As per Economist [1], *the answer is to remain competitive, and to give low- and high-skilled workers alike the best chance of success, economies need to offer training and career-focused education throughout people's working lives.*

As per study by Harvard Business Review [2], lifelong learning is not only an economic imperative, however, it is good for health and social life as well. It is also predicted that by 2030, 50% of current jobs will go away due to automation, AI and other newer technologies and people need to retool themselves with new skills continuously and the study found, *learning isn't simply about earning degrees or attending storied institutions. Books, online courses, MOOCs, professional development programs, podcasts, and other resources have never been more abundant or accessible, making it easier than ever to make a habit of lifelong learning. Every day, each of us is offered*

the opportunity to pursue intellectual development in ways that are tailored to our learning style.

A Wall Street Journal [3] poll concluded, *Americans Losing Faith in College Degrees*, especially young adults and rural residents increasingly say college isn't worth the cost. Student debt has surged to \$1.3 trillion Some Americans believe learning a trade offers more security than going to college and millions of Americans have fallen behind on student-loan payments and many Americans believe learning a trade offers more security than going to college.

All these data points indicate that it is a no brainer for most people to be lifelong learners, especially with the educational technology available to deliver MOOC's, online and mobile device training, etc. However, there seems to be a problem, as Harvard Business Review [2] asked, *"So why don't more of us seize that opportunity? We know it's worth the time, and yet we find it so hard to make the time?"*

As per Pew Research Center survey [4], 73% of US adults consider themselves lifelong learners and 74% of adults are what they call personal learners. Interestingly, only 16% of the adults had taken an online course and that those with more education and higher incomes were more likely to engage in lifelong learning (see Figure 1).

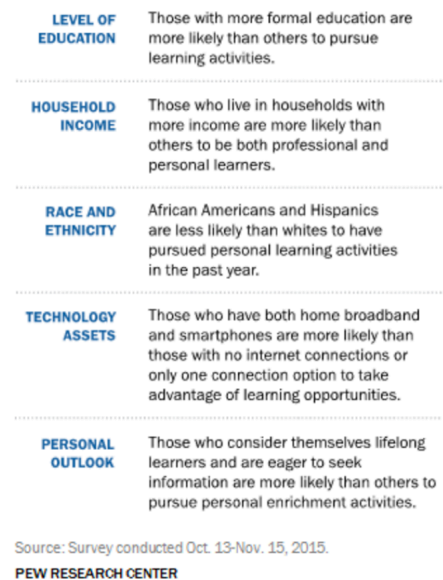


Figure 1. Learning Activities are tied to a variety of factors

The World Health Organization has coined the term active aging to describe the process of remaining connected with intellectual pursuits, social structures, and the community as people grow older. Life satisfaction is likely to increase when elders can access educational resources, whether alone or in a more traditional group context. Significant gap seems to exist between how some adults view learning in general and their actual lifelong learning behaviors.

The focus of the research for this paper is to answer the below questions, research what solutions are available, what are still the gaps and recommend solutions:

- What motivates lifelong learners and what outcomes are they trying to achieve?
- How many actively pursue continuous learning and how effective are they in achieving the outcomes?
- What are the barriers which prevents individuals from making lifelong learning a reality and are the barriers universal or only to certain underrepresented communities? Is the learning democratized?
- Can technology be leveraged to address the barriers, make learning effective to help achieve outcomes and be democratized?
- Is there a digital technology platform for one to establish lifelong learning goals, implement plans to continuously acquire different skills especially for those who cannot afford to go to college and underrepresented communities and don't have time or money to afford full time education?

METHODOLOGY

With the goal of using technology to make *Lifelong Learning a reality for all*, the research is based on publicly available paper, reputed magazines, universities and research organizations. Survey employees in a Fortune 500 company, as well as Georgia Institute of Technology OMSCS students to further prioritize the motivations, needs and outcomes. Following steps were taken to establish requirements for a platform for lifelong learning, leveraging technology which is available to everyone regardless of age, income, location or situation to be able to pick up new skills with increasing "learning velocity".

- Identify the motivations, outcomes, learning styles and benefits of Lifelong Learning
- Identify the barriers to lifelong learning, especially for underrepresented communities
- Understand what solutions are available for lifelong learning which addresses the outcomes and barriers
- Identify solutions leveraging technology to address the outcomes and barriers

Motivations and Outcomes of Lifelong Learning

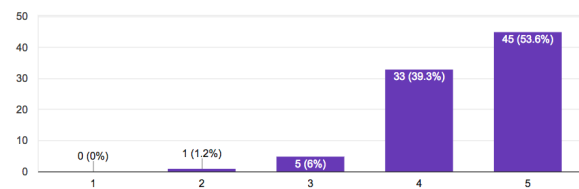
"In Lifelong learning; why do we need it?" [5], article based on research provides basis for main motivations which follow lifelong learning: "Our world is changing

around us in such a frantic pace that if we do not continue to grow and develop; we will soon be left behind. In the 21st century, we all need to be lifelong learners. We need to continually keep our skills sharp and up to date so that we have an edge in all we do. Of course, we all have a natural desire to learn for adapting to change, enriching and fulfilling our lives".

In order to determine the top motivations, a survey of Georgia Tech OMSCS students to determine their Lifelong Learning Motivations and survey questions which received highest importance are shown in Figure 2.

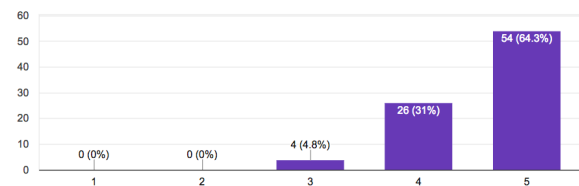
1. Skill-up: Function effectively day-to-day amidst a rapidly changing world, we need to learn new skills

84 responses



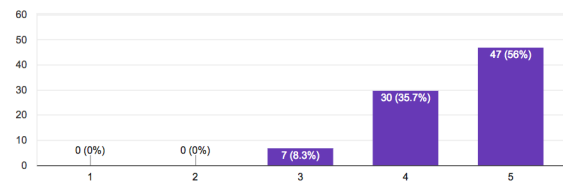
2. Purpose and Path: Belief that we should continue to learn and grow throughout our lives to be life-ready

84 responses



3. Passions and Life Satisfaction. Pursuing passions and interests outside of work is important.

84 responses



5. Learning is becoming an economic imperative: Technological change demands stronger and more continuous connections between education and employment

84 responses

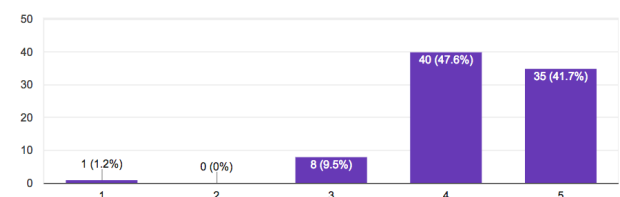


Figure 2. Lifelong Learning Motivation Survey Results

The responses from OMSCS students indicated that key motivations for lifelong learning are day to day functional effectiveness, life readiness, passion for learning leading to satisfaction and economics reasons. The responses also indicated employability, social awareness and longevity were somewhat important, however, secondary to many.

In another study done over 30 years [6], by Stanford Professor Carol Dweck, developed the growth mindset theory, which states that an individual's learning is shaped by whether one believes in their intelligence is fixed or can be changed. Those with a growth mindset believe they can improve their abilities through effort and effective learning techniques, the theory states that one can learn to do anything one wants.

As per Harvard Business Review, organizations and hiring managers are always on the lookout for people who ask smart questions, explore new ideas and solutions, and are eager to grow. Much of that mindset comes down to one vital quality: curiosity.

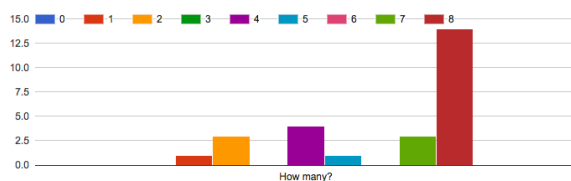
With many consider themselves to be lifelong learners, have growth mindset and curiosity profiles, the next question that would be interesting understand is how many are actually practicing lifelong learning

A three-part survey was designed to test and validate the hypothesis about mindset, second to establish the curiosity profile and third how many of these actually practiced lifelong learning. The surveys were conducted with two cohorts, Georgia Tech OMSCS Students and a Fortune 500 company employees.

Part 1: Mindset Survey conducted at below URL:

<https://mindsetonline.com/testyourmindset/step1.php>

You agreed with ___ number of Growth Mindset Statements.



You agreed with ___ number of Fixed Mindset statements?

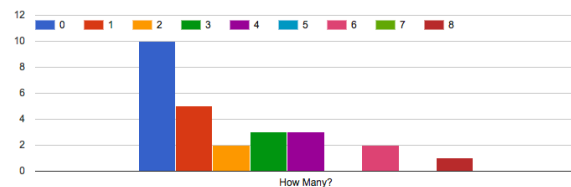
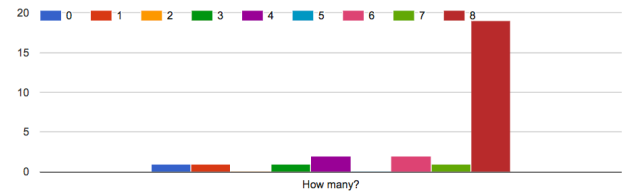


Figure 3. Georgia Tech OMSCS Mindset Survey

You agreed with ___ number of Growth Mindset Statements.



You agreed with ___ number of Fixed Mindset statements?

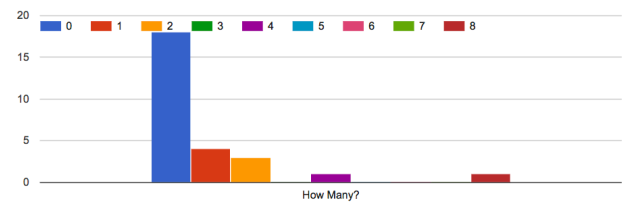


Figure 4. Fortune 500 Company Mindset Survey

The results provided two numbers, one for # of Growth Mindset of Statements and second for # of Fixed Mind statements.

Results showed majority of OMSCS students and Fortune 500 employees who took this survey truly have growth mindset and a few had fixed mindset.

Part 2: Curiosity Profile Survey at URL:

<https://hbr.org/2015/12/assessment-whats-your-curiosity-profile>

For the second part of this survey, surveyed the same people who participated in the mindset survey to see what type of curiosity profiles they had, as research shows folks who are curious tend to be continuous learners and also purposeful learners. The Harvard Business Review survey to establish the curiosity profiles of both OMSCS and Fortune 500 company employees.

There were 36 questions (Sample questions below):

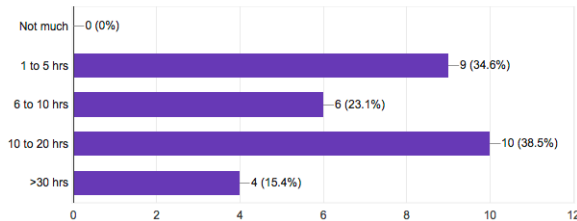
- I get bored easily.
- I don't care how it works as long as it works.
- I love the excitement of the unknown.
- I like repetition.

This survey showed majority had a curiosity profiles of unconventional thinkers, were intellectual and seem new experiences and relationships, all attributes of a strong lifelong learners.

Part 3: With many considering themselves to be lifelong learners, have growth mindset and curiosity profiles, the next question that was tested was to understand how many are actually practicing lifelong learning. Figure 5 provides the responses from OMSCS students and the Fortune 500 company employees.

How many hours per week do you dedicate to learning new things?

26 responses



How many hours per week do you dedicate to learning new things?

27 responses

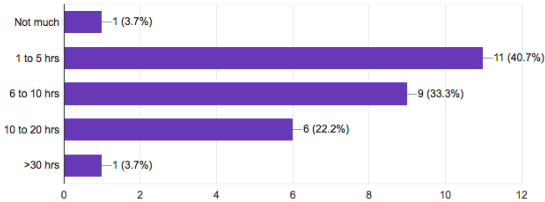


Figure 5. OMSCS (top) and Fortune 500 (bottom): How many actively practice Lifelong Learning?

The surveys showed that majority of people surveyed spent at least 5 hrs and several spent more than 30 hrs learning.

Barriers to lifelong learning

Pew Research Center survey [4] found that those with more education and higher incomes were more likely to engage in lifelong learning and also only 16% had taken an online course! As per the survey there are three significant barriers for lifelong learning:

Limited Access: Online and technology based learning is not democratized—adult learners with limited education do not engage in learning aided by technology. Less than half of respondents with a high school education or less have used the internet for personal or job-related learning (and adult learners with limited education do not engage in learning aided by technology).

Lack of familiarity: With learning aided by technology options persists among all adult learning groups; example only 14% are “very familiar” with even the concept of distance learning, and MOOCs—only 5% are “very familiar”, with many not aware of key new digital platforms and methods of learning.

Learning gap: Significant gap between how some adults view learning in general and their actual lifelong learning behaviors—the majority of Americans (87%) believe

learning new things is “very important” yet only 73% of adults consider themselves lifelong learner.

Solutions survey for lifelong learning

There are several communities already working to address the barriers to lifelong learning and these include public libraries and educational institutions, start-up companies and technology solutions including MOOC’s.

Communities involved in Lifelong Learning

Many public libraries such as [the New York Public Library](#), are trying to address these barriers with the mission of inspiring lifelong learning, advance knowledge, and strengthen the communities. Libraries provide free online access to lower income and adult learners, free training and learning aids. Some companies such as Bank of America are forming partnerships with institutions such as Khan Academy for their [Better Money Habits®](#) program.

Educators are starting to play a role in closing the gap by introducing instilling skills and habits associated with lifelong learning in elementary, middle and high school where learning is self-directed and lifelong, to forge their own learning path based upon their, interests needs, and passions.

Technology solution survey for Lifelong Learning

There are several emerging platforms and solutions available to address the barriers by starting to provide lifelong digital learning platforms and some of the companies/start-ups surveyed are as follows:

www.degreed.com: Degreed is an education technology company engaged in enabling and recognizing all forms lifelong learning and the platform allows users to discover, curate, share, track, and value learning from any source. The platform allows to learn with purpose and Find, track, and measure everything one is learning.

<https://www.grovo.com/platform>: Grovo is a learning platform with a notion of micro learning, with each of the activities less than 2 min and built in assessment by combining intuitive technology and rich, bite-sized content to give users the fastest, most engaging way to learn and train at work.

<https://novoed.com/>: Founded at Stanford, NovoEd, is a software company which has developed technology to make online learning more like in-person learning via social, collaboration, and mobile capabilities to deliver a more engaging learning experience.

www.edx.com: Created by Harvard and MIT, edX is a massive open online course provider and hosts online university-level courses in a wide range of disciplines to a worldwide student body, including many courses at no charge, provides global access to quality education and connects learners to the best universities and institutions from around the world.

Survey of Lifelong Learning Styles

Elon Musk is one of the famous lifelong learners and is supposed to be very good very specific type of learning called “*learning transfer*”. Learning transfer is about what one learns in one context and applying it to another domain or context or another industry. Learning transfer involves decomposing what is learned into fundamental principles, like laws of physics and Musk’s answer on a [Reddit AMA](#) describes the process as follows:

It is important to view knowledge as sort of a semantic tree—make sure you understand the fundamental principles, i.e. the trunk and big branches, before you get into the leaves/details or there is nothing for them to hang onto.

One other form of learning style, is Deliberate Learning, when one sets aside time and effort specifically to learn, helps a learner make progress mastering a new skill because they have dedicated time to think and reflect.

Another style is an autodidact, or a self-learner, someone who couples a passion for learning with the determination to continuously seek the outlines of knowledge in a field of interest and look for ways to expand on acquired knowledge in a structured, effective way.

CONCLUSION

This paper focused on establishing why is lifelong learning needed, what are the motivations and outcomes for people pursuing lifelong learning, what are the barriers to lifelong learning, what solutions are available to address the barriers and also what are the learning styles including most well-known lifelong learners such as Elon Musk use to be effective.

The unique understanding from this research was that lifelong learning is definitely an economic imperative and is must for everyone in the today’s economy. The effectiveness of learning depends on the individuals, whether one has a growth mindset, is curious and whether one practices deliberate style of learning, are autodidact’s or self-learners. The research also established the need to address the barriers to lifelong learning and what is available out there and what needs be done differently in terms of digital lifelong learning platforms.

Many of the highly successful people such as Bill Gates, Elon Musk, Satya Nadella, and others are proven to be continuous learners. However, the fact that lifelong learning seems to be limited to affluent people and there is a need for lifelong learning to be democratized.

RECOMMENDATION: LIFELONG LEARNING PLATFORM

We need a lifelong learning platform which will make lifelong learning affordable and practical for everyone, especially underrepresented populations. This will help everyone achieve their career and life goals, reduce the fear of AI and Automation taking all the jobs away. This will

include removing barriers such as limited access to those with less education and folks with lower income and adult learners and increasing the familiarity of digital learning options and addressing the learning gap for communities which views learning as very important, yet don’t seem to engage in lifelong learning.

The digital lifelong platform needs to incorporate the following requirements:

1. Enable deliberate learning with specific learning goals: Make it very simple and easy for learners to set learning goals on weekly and monthly basis and let them know how they are doing. People should be able to monitor their own progress through the platform and employers should provide support as necessary and career development departments should be able to track learning efforts to identify and support organization-wide learning efforts.
2. Free and easy access to all learning to anyone and from anywhere, may be using open source community concept, we need a system for open source learning systems. Edx and others are trying to make learning open and free, however not all content is available to everyone and becomes expensive to sign up for different platforms. What is the need for multiple learning platforms, for knowledge on any topic can be shared universally and everyone can focus on adding new unique content or enabling for different learning styles?
3. The platform should enable, deliberate deep learning with hands on exercises with feedback loops and enable learning transfer, so that everyone can apply what they learn in one context to other contexts. Be able to track what they have learned thru out their lives and use technologies such as blockchain to validate the authenticity of the skills learned, without having to go to traditional colleges for just getting an official certificate, which is time consuming and expensive
4. Everyone is a lifelong learner, as we are all learning all the time, as that's how human beings are. We need to provide a platform which is open and free, easy to use and access to all fundamental learning material in the world to everyone, anywhere.
5. The different lifelong learning platforms should look at open sourcing their technology to create a common platform for all educational communities to use. This is similar to building Infrastructure as a Service (IaaS) and one could imagine a Lifelong Learning as a service (LaaS), which can provide a foundation to create, share content and implement different learning styles and be localized for different languages and underserved populations.

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