# Understanding the Self-Directed Online Learning Preferences, Goals, Achievements, and Challenges of MIT OpenCourseWare Subscribers

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# Understanding the Self-Directed Online Learning Preferences, Goals, Achievements, and Challenges of MIT OpenCourseWare Subscribers


## ABSTRACT

This research targeted the learning preferences, goals and motivations, achievements, challenges, and possibilities for life change of self-directed online learners who subscribed to the monthly OpenCourseWare (OCW) e-newsletter from MIT. Data collection included a 25-item survey of 1,429 newsletter subscribers; 613 of whom also completed an additional 15 open-ended survey items. The 25 close-ended survey findings indicated that respondents used a wide range of devices and places to learn for their self-directed learning needs. Key motivational factors included curiosity, interest, and internal need for self-improvement. Factors leading to success or personal change included freedom to learn, resource abundance, choice, control, and fun. In terms of achievements, respondents were learning both specific skills as well as more general skills that help them advance in their careers. Science, math, and foreign language skills were the most desired by the survey respondents. The key obstacles or challenges faced were time, lack of high quality open resources, and membership or technology fees. Several brief stories of life change across different age ranges are documented. Among the chief implications is that learning something new to enhance one's life or to help others is often more important than course transcript credit or a certificate of completion.



**Keywords:** Open education, OpenCourseWare, Self-directed learning, Massive open online courses (MOOCs), Informal learning, Motivation


## Introduction

Twenty-first century learners now have a seemingly endless array of open educational resources (OER), open courseware (OCW), and massive open online courses (MOOCs) available for their self-directed learning pursuits. For example, Wendy Ermold, a researcher and field technician for the University of Washington Polar Science Center conducts research in remote northern regions of the world (Bonk, 2009). Wendy informed us that when out on the icebreakers or remote islands, she listens to lectures and reviews various OER she has found. The content she uses often comes from the MIT OCW project as well as from Stanford University, Seattle Pacific University, and Missouri State University. As such free and open educational resources expand, learning becomes increasingly personalized.

Hundreds of millions of people like Wendy are now learning using some online tool, resource, or activity each day. As such, the web offers new hope for learning a hobby, obtaining a certificate or degree, or pursuing some other personal lifelong learning dream. Unfortunately, there are few research projects documenting the results of the use of open educational content (Iiyoshi & Kumar, 2008). There is a need to find out what motivates people to learn informally from open educational content and what skills they are attempting to learn. It is also vital to document the challenges and obstacles such learners face. At the same time, case studies of individuals whose lives have been altered or significantly changed from such casual informal learning online as well as more extended informal learning pursuits can serve as inspirational stories to others.

This paper documents the informal learning experiences and preferences of those using open educational contents as well as their motivations, achievements, and obstacles. It also captures a few samples of life changes or "empowerment moments" across different age ranges from open

educational opportunities. By cataloguing some of the ways in which informal and nontraditional web-based learning have impacted people across ages, gender, ethnicities, and cultures, we hope to encourage others to continue to learn across the lifespan. This study is among the first steps in this process.

## The OpenCourseWare (OCW) Initiative

On April 4, 2001 (i.e., 4-4-1), Charles Vest, then president of MIT, made an historic announcement with the explicit goal of having most of his prestigious university's courses on freely available on the web within a decade (MIT News, 2001). A little over a month later, on May 25, 2001, CCN reporter, Richard Stenger (2001), reminded us that it was the fortieth anniversary of the speech by former U.S. President John F. Kennedy wherein he offered a similar bold challenge to get a person to the moon and back by the end of the 1960s. Like Kennedy's dream of space travel before him, some educators thought Vest's speech was a rather bold and unattainable proclamation. Nevertheless, by the early part of 2009, MIT had its entire curriculum of over 1,800 courses online. In fact, MIT beat its original target by more than 3 years (MIT, 2007). Today, all of MIT's courses are not only available for self-directed learners around the globe to explore, download, use, and share, but for high school students in advanced placement courses in sciences, mathematics, engineering, and the humanities and social sciences as well as for those taking massive open online courses (MOOCs). Importantly, these courses are continually updated, enhanced, and expanded upon.

Vest had thought that the Council on Educational Technology that he had tasked with investigating online learning and opportunities outside classroom walls would come up with new revenue models for MIT content. He did not envision that MIT would be giving away his contents on the web. At the same time, he thought that the OCW project would be highly innovative and help advance education by widening access to it and inspiring other institutions of higher learning to also participate. As Vest (MIT News, 2001) noted,

> "This is about something bigger than MIT. I hope other universities will see us as educational leaders in this arena, and we very much hope that OpenCourseWare will draw other universities to do the same. We would be delighted if -- over time -- we have a world wide web of knowledge that raises the quality of learning -- and ultimately, the quality of life -- around the globe."

Vest viewed the OCW initiative as one that embraced the openness of education and outreach to underserved and disadvantaged populations as well as professionals in the workplace, college professors seeking innovative teaching examples, and retirees wanting to learn or experience new hobbies. Learners could draw upon these materials for self-study and self-improvement. At the same time, instructors soon could share contents through a consortium OCW types of projects on other campuses around the world (Carson, 2009; Caswell, Henson, Jensen, & Wiley, 2007). With more than 2.2 million visitors to the OCW website each month and translation sites receiving hundreds of thousands of additional visits (S. E. Carson, personal communication, January 14, 2014), there is no doubt that Vest was correct in assuming that there was a large population interested in such content.

## The Rise of Online Self-directed Learning

With the advancement of various learning technologies combined with the opening up of educational resources, issues related to self-directed learning have gained much interest in various fields. Self-directed learning is defined as "a learner's autonomous ability to manage his or her own learning process, by perceiving oneself as the source of one's own actions and decisions as a responsibility towards one's own lifelong learning" (Sze-Yeng & Hussian 2010, p. 1913). Stated another way, self-directed learners take initiative related to their own learning with or without an instructor present. Prominent adult educator, Stephen Brookfield (2013) places emphasis in learners deciding on what to learn, when to learn it, how much to learn, and whether something has been learned well enough. From his perspective, the truly self-directed learner is empowered, not controlled by external decisions to acquire predetermined skills or negotiate through some heavily structured curricula. Learning decisions rest with the learner.

As indicated, online learning and free and open contents have also transformed many aspects of life for adult learners. For instance, through OCW, OER, and now MOOCs, those stuck behind prison walls, injured and in a hospital bed, or unemployed and unable to pay for college tuition can learn to be more productive members of society. Some people might be in transition from one career to another and find OER and OCW can arouse new interests and confidence (Iiyoshi & Kumar, 2008). Still others might be enrolling in online courses or MOOCs while in war zones in Iraq or Afghanistan (Kenning, 2012).

As society moves from an age of information scarcity to one of abundance, opportunities for learners to informally learn and self-direct important aspects of their learning lives have emerged. Decades of research from Edward Deci and Richard Ryan on self-determined learning (Deci & Ryan, 2012), for instance, has highlighted the need for learners to engage in tasks that they find personally meaningful, interesting, and enjoyable across the lifespan. From their viewpoint, learners who are self-determined have a high sense of autonomy, competence, and relatedness to others. Through personal goal-setting, they self-monitor and evaluate their learning progress (Reeve, 1996). In effect, they take responsibility for their own learning.

Such views parallel one's from humanist Carl Rogers (1983) who argued that humans learn best in environments that involve much choice, respect learner interests, and are highly collaborative. He believed that those who felt a sense of freedom and openness to new experiences would become more expressive and creative. From this perspective, learner participation is emphasized over learning consumption of lectures and book materials.

With the growth of open education contents and learning portals on nearly any topic of importance, members of the twenty-first century now have a plethora of choices and opportunities about what they will learn. Mol and van Dam (2013) note that the future of work depends on people being able to acquire the skills that they need when they need them. They further contend that open educational opportunities such as MOOCs offer a powerful way to reskill the workforce and build expertise from the cloud with an on-demand training program.

Given the expanding growth of online information and educational resources, there is a mounting need for research on self-directed learning (Hyland & Kranzow, 2011).

## Research on Self-Directed Learning

There has been increasing research attention on self-directed learning during the past decade in both formal and informal learning environments. For instance, based on a course designed using a self-directed learning approach, a study by Sze-Yeng and Hussian (2010) attempted to foster self-directed learning of instructional technology master's students. To accomplish this goal, they employed a blended learning environment using Moodle, Google Docs, and Wikispaces based on socio-constructivist principles. Their design decisions involved students becoming aware of their own existing knowledge and further expanding on it through interaction with peers and teachers.

Self-directed online learning is essential today in most professional fields, especially in healthcare (Li, Tancredi, Co, & West, 2010). For instance, El-Glinay and Abusaad (2013) investigated the self-directed learning readiness and learning styles among undergraduate nursing students. They noted that the reason for the interest in self-directed leaning in nursing education during the past few decades is due to the increasing complexity and myriad changes within the nursing profession. Importantly, they found no relationship between self-directed learning readiness (SDLR) and learning styles, nor was it related to age, gender, marital status, or urban or rural residence. Such findings, in effect, imply that there is much opportunity to learn through self-direction across the lifespan.

In a national survey of pediatric medical residents and program directors, Li et al. (2010) attempted to identify the factors that contributed to successful self-directed learning. The results revealed that the learner-level factors such as using a system to track one's progress in achieving learning goals, a propensity toward lifelong learning, and higher levels of confidence in self-directed learning, as compared to the program-level factors, were more vital to the success of these self-directed learners.

In terms of research on informal learning, attempts have been made to evaluate the effectiveness of informal learning in the workplace (Jeon & Kim, 2011) as well as the value of the interactions that are happening in the informal learning environments such as YouTube or Facebook (Tan, 2013). Over the past few years, informal learning in the workplace has been gaining increasing attention and interest due to the need for prompt updates on skills and information in most jobs. New forms of learning and literacy are forming at the intersection of academic needs and informal learning sources including unique spaces like the Khan Academy and other YouTube channels (Goodfellow, 2011; Meyers, 2014). Such resources challenge traditional forms of learning and interaction (Tan, 2013).

## Purpose and Method

The purpose of this study is to explore the self-directed and informal learning experiences of subscribers to the monthly MIT OpenCourseWare (OCW) online newsletter. In particular, the research targeted the (1) learning preferences, (2) goals and motivations, (3) achievements, (4) obstacles and challenges, and (5) possibilities for life change of self-directed online learners. With greater understanding of the goals and successes as well as the obstacles that self-directed online learners face, educators and instructional designers can design and develop more relevant and potentially powerful online learning contents and instructional scaffolds.

Prior to the study, a list of over 300 informal and extreme learning websites related to language learning, social change, global education, virtual education, adventure learning, shared online video, and open education in general had been generated and then evaluated by a team of researchers using an eight-part coding scheme (Jung, Kim, Wang, & Bonk, 2011; Kim, Jung, Altuwaijri, Wang, & Bonk, in press). During the evaluation process, the researchers noted a wide array and diversity of informal learning experiences, skills or competencies emphasized, delivery mechanisms and technologies utilized, motivational techniques employed, and potential barriers or obstacles to their use. One particularly interesting website that the team evaluated was the OCW project from MIT. Consequently, MIT OCW officials were contracted to participate in this study. Using insights from the website evaluation process, a 40-item survey (see http://trainingshare.com/pdfs/MIT-survey.pdf) was designed that took MIT OCW participants around 15 to 20 minutes to complete (to simulate taking the survey, see http://www.surveyshare.com/s/AYA4CTD).

The close-ended portion of the survey inquired into many aspects of informal learning: the goals one wished to accomplish through informal learning pursuits and activities, the reasons for exploring web resources informally, the factors leading to success, what they would like to learn informally online, and the typical barriers or obstacles faced when learning informally on the web. We also asked a question about what they would like to achieve from their informal learning online.

In addition to the initial 25 close-ended questions, respondents had the option to complete 15 open-ended questions. The open ended questions included those related to goals and aspirations as well as challenges and obstacles and possible life changes using OER, OCW, and MOOCs. Participants were also asked about their most interesting and successful informal learning experiences and what they accomplished.

After qualitative researchers on our team analyzed the data multiple times, a decision was made to examine the 15 answers for each survey participant; in effect, treating these answers as one short interview per respondent. As a result, respondent goals and motivations for utilizing OCW and other forms of open education might be apparent in the question that specifically asked about it as well as in other question responses. Two rounds of coding produced the necessary coding schemes. The qualitative data presented here are intended to make evident how lives are impacted from open education across the lifespan.

**Participants**

The research data was collected in August 2012 through a web-based survey. The sample was derived from subscribers to the e-newsletter related to the popular MIT OCW initiative. At the time, the newsletter subscription list had more than 156,000 active subscribers, of which, some 41 percent were described as self-learners, 40 percent students, 15 percent educators, and 3 percent parents and other users (MIT OpenCourseWare, 2012). About 26,700 people opened the email and 4,000 people clicked through to the survey. Some 1,429 people completed the survey, including 613 people who completed one or all of the optional open-ended survey items.

In terms of age, about half of the 1,429 survey respondents were age 40 or younger. Interestingly, 64 respondents were over age 70 which equated to roughly 5 percent of the MIT OCW sample pool. In addition, most in the MIT sample were males (76 percent). While nearly half of the respondents were from North America (618 people; 44 percent), a significant number came from Asia (331 people; 23 percent), Europe (202 people; 14 percent), and South America (133 people; almost 10 percent). Among the top countries represented in the MIT OCW subscriber list were the United States, India, China, Brazil, Nigeria, Pakistan, Iran, Canada, the UK, Taiwan, Indonesia, Mexico, and Egypt.

## Findings from Close-Ended Survey Questions

**(1)** ***Learning Preferences Results.*** The survey results indicated that the respondents typically used a laptop (83 percent) or desktop (72 percent) to access informal learning resources, though some used a smartphone (38 percent), tablet computer (29 percent), or e-book reader (29 percent). Respondents were also learning from devices such as iPods, car CD players, and the Internet on their televisions.

We also inquired where these self-directed learners were learning informally. Among the popular places for accessing informal learning resources and materials were at home (91 percent), work (44 percent), school or university (40 percent), libraries (36 percent), anywhere with a mobile device (36 percent), and cafes and bookstores (26 percent). However, as shown in Figure 1, web access from airports, buses, subways, and trains were also among the common places respondents went online to learn something.

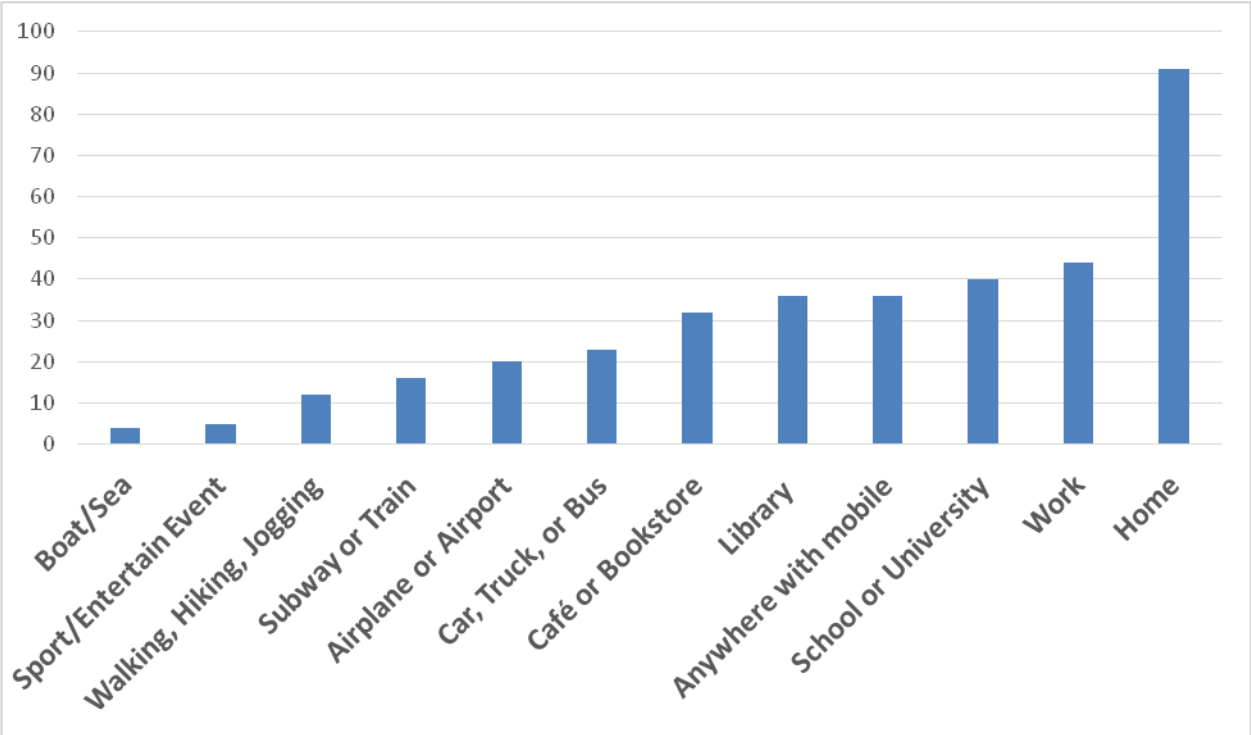


*Figure 1.* Where self-directed online learners engage in informal learning

We asked two questions about specific tools and web resources self-directed online learners used when seeking new skills, information, or answers to their questions. First, we asked the respondents to list the three best websites--other than search engines like Bing or Google--that they used when they had a fairly simple task or question. Of the 1,429 survey respondents, 1,237 provided at least one answer and 785 of them listed three as requested. The overwhelming majority (715 people) listed Wikipedia as their primary source for their basic information needs. The second most popular website was the MIT OCW project which all these people had subscribed to (256 people). Third in line was YouTube (170 people). Next came the Khan Academy (73 people), How Stuff Works (54 people), Wolfram Alpha (48 people), eHow (46 people), and Ask.com (40 people). In addition, between 25 and 36 people listed About.com, Stack Overflow, NPTEL (National Program on Technology Enhanced Learning) India, Coursera, the New York Times, WebMD, and Yahoo! Answers as resources that they used to address such basic knowledge question needs.

The following question asked the respondents to list the three best educational or information-rich websites that they "might recommend to others that can significantly influence or change their lives in a positive way." Interestingly, the main life changing resource among these subscribers to the MIT OCW newsletter was MIT OCW itself (649 people). In effect, there apparently was plenty of potential for life change embedded in the very resources that they were relying on. The other three websites that more than 100 survey respondents listed were Wikipedia (289 people), the Khan Academy (145 people), and Coursera (144 people). Other highly popular resources included TED (84 people), YouTube (67 people), and Udacity (55 people). Resources with at least 25 votes included Stanford (presumably, the Stanford Venture

Lab which offered a series of MOOCs), iTunes University, NPTEL India, edX, the BBC, and How Stuff Works.

***(2) Goals and Motivations Results.*** While grasping the learning preferences related to the external factors impacting self-directed learning such as devices, locations, and tools is illuminating, it is equally or more important to know the learner goals, needs, and overall motivations when engaging in informal and self-directed online learning. As shown in Figure 2, intrinsic motivation trumped extrinsic motivation for these self-directed learners. More specifically, curiosity, seeking information, self-improvement, and wanting to learn something were the key reasons to informally explore the web to learn. Nearly 70 percent, in fact, had personal goals for self-improvement. A similar percentage were simply satisfying their curiosity. More impressively, nearly 80 percent entered the web to find out about a particular topic (see Figure 3). Also of interest was that more than half of the respondents were learning online for professional development reasons. Similarly, 54 percent used the web because they wanted more information and 57 percent wanted to learn something new. Some wanted personal control over their learning (46 percent) or personally felt that they needed new skills (46 percent). Fewer respondents were exploring the web to help with their hobbies (35 percent) or because they wanted to make a contribution to society (27 percent).

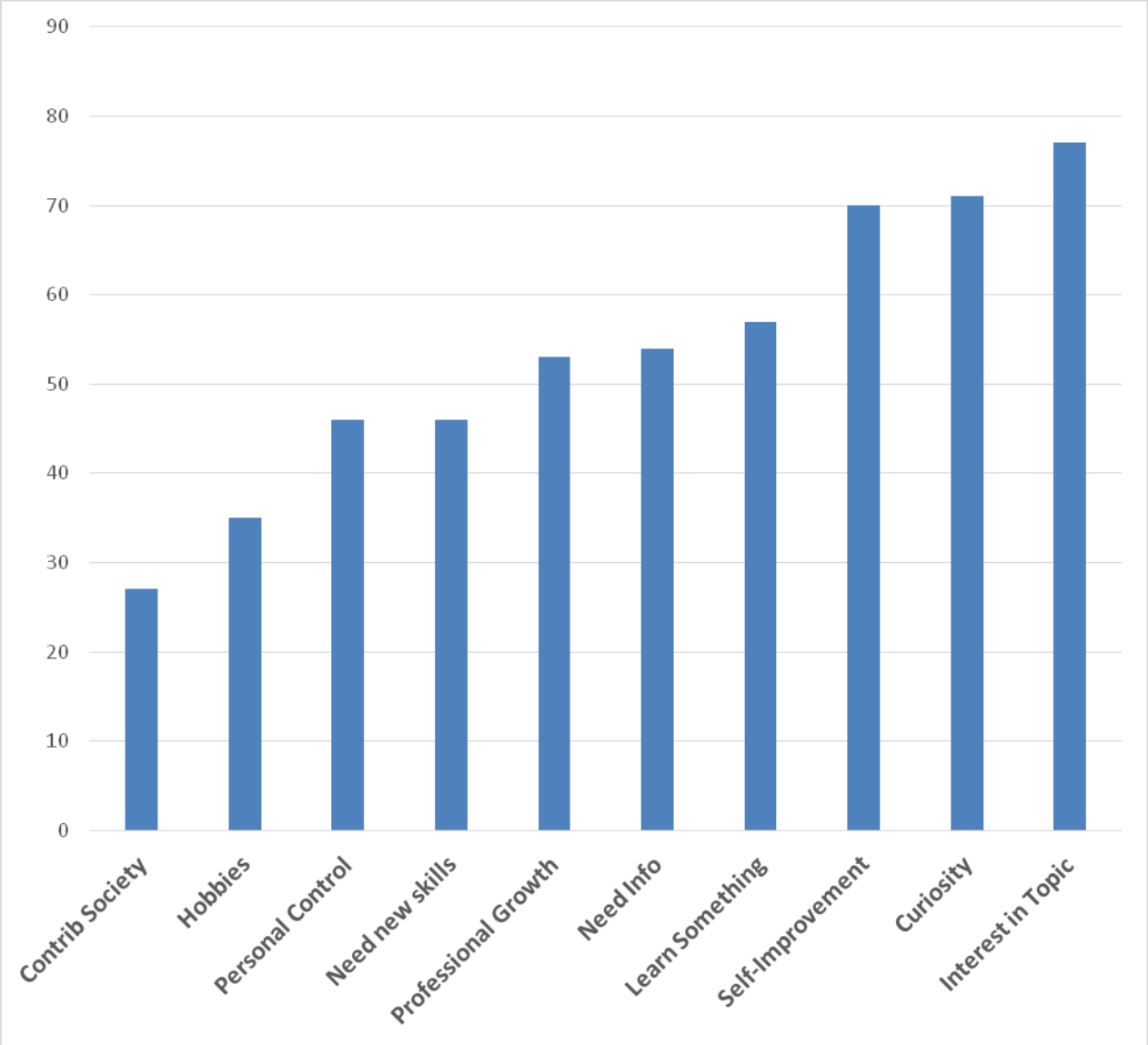


*Figure 2.* Main reasons to informally explore the web to learn

The researchers specifically asked about key factors that typically led to their online learning successes when engaging in informal online experiences (see Figure 3). As predicted by humanistic psychologists like Rogers (1983), freedom to learn was rated most important to their success (72 percent). The next most important factors were a sense of resource abundance (47 percent), choice (44 percent), control over the activity or resource (41 percent), sense of fun (40 percent), and producing or creating something new (37 percent). Factors like system support, feedback, novelty, sharing, collaboration, and sense of adventure were also valued in different degrees.

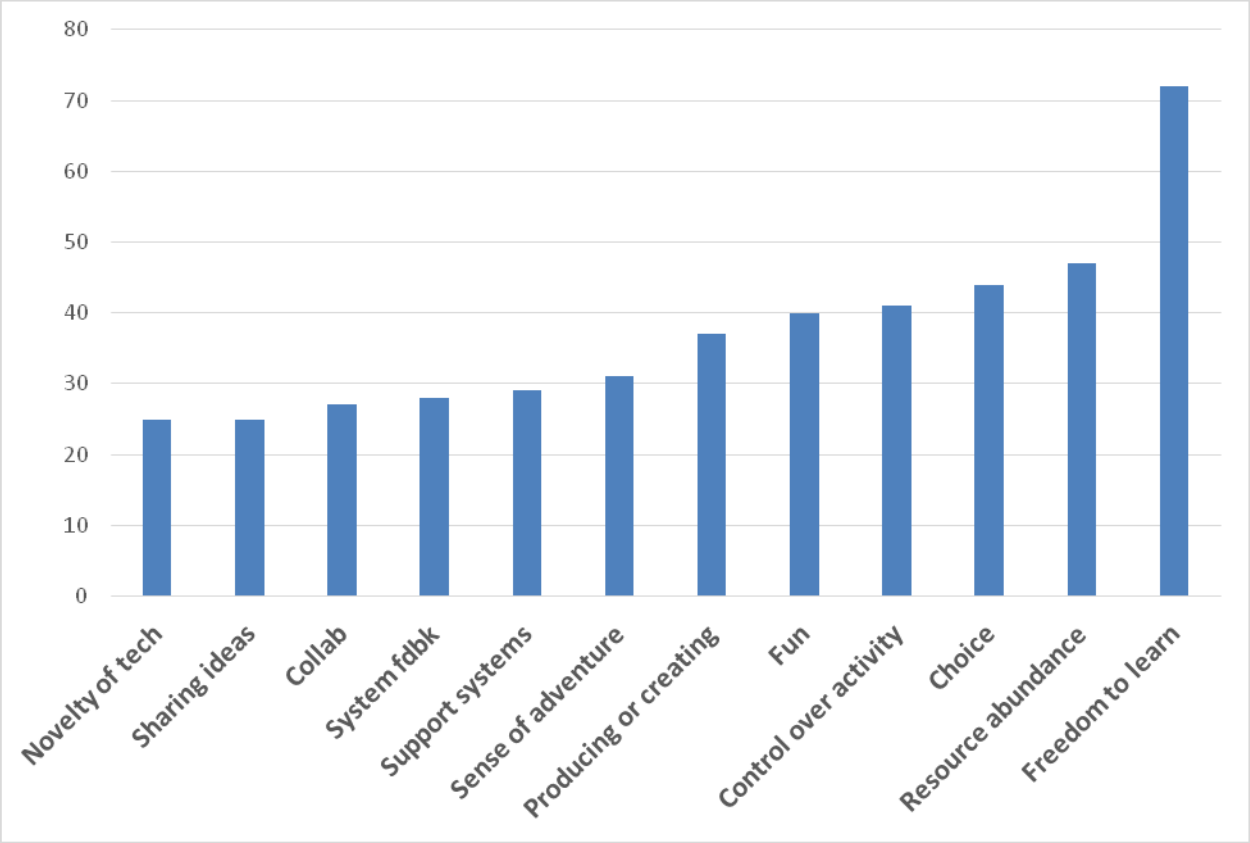


*Figure 3.* Factors leading to success or personal change what learning informally online

Participants were asked what they would like to achieve from their informal learning endeavors (see Figure 4). While nearly 85 percent sought out informal online learning for a new skill or competency, 57 percent were there to engage in a learning experience that would better their life. Some wanted to simply fix something at home (43 percent), whereas others had more grandiose goals of helping society (47 percent), learning something to help others (53 percent), or acquiring information about cultures or communities in the world (41 percent). About 46 percent were actually hoping to obtain course credit, while 38 percent wanted a course or module but did not care if it led to a degree.

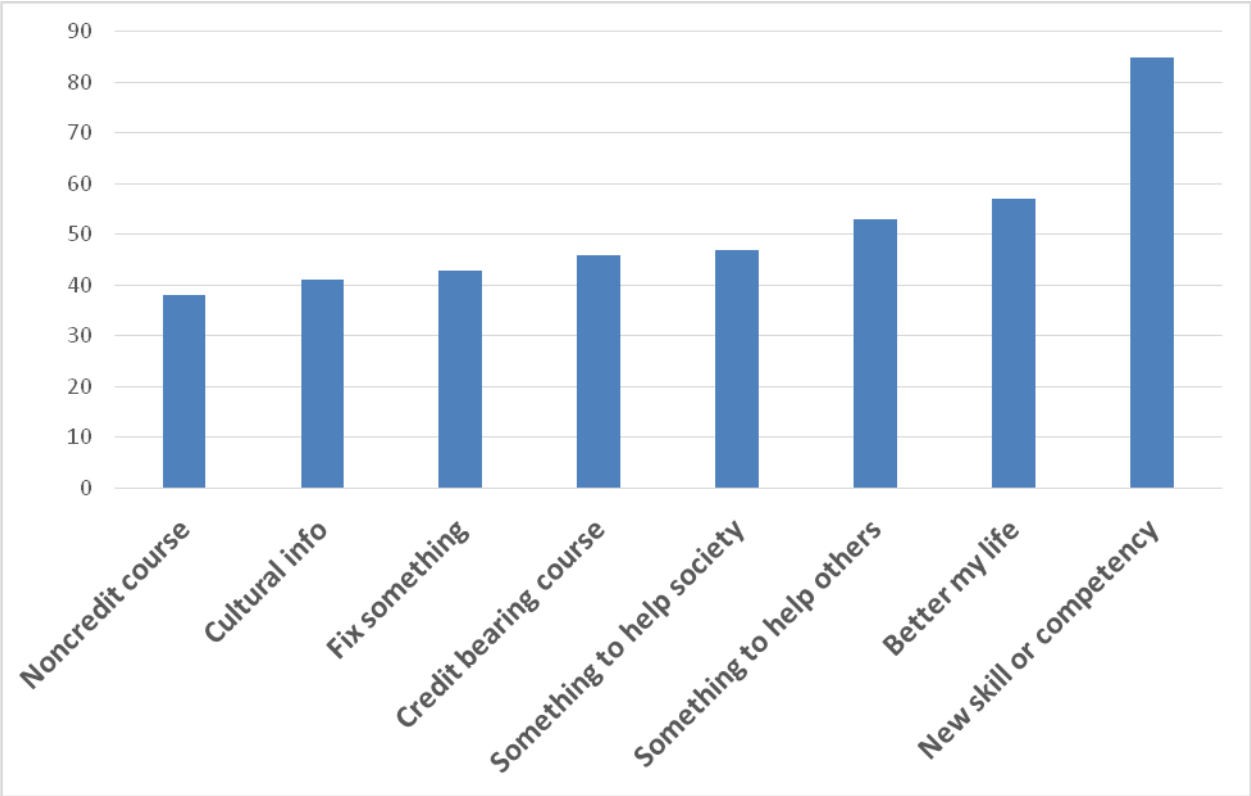


*Figure 4.* What would you like to achieve from informal learning online

In terms of specific skills, it is not too surprising that people seeking access to course resources from MIT would be interested in learning mathematics and science related content. In fact, more than 60 percent of the respondents were seeking mathematics content and over 75 percent were interested in science (see Figure 5). The only other category above 50 percent was foreign language at 57 percent. Given the emphasis on math and science skills as would be expected from users of MIT OCW, it was interestingly that more than 4 in 10 people were seeking global information (45 percent) and cultural information (42 percent). In addition, nearly 4 in 10 were accessing these resources for historical content (39 percent) or health-related information (37 percent). And about one-third of them were seeking new vocabulary skills as well as environmental information. Art and music information or resources were only sought out by 1 in 4 people. Even fewer were interested in acquiring outdoor skills (15 percent) or athletic skills (10 percent). Clearly, there were many different types of learning pursuits from these open educational resources provided by MIT and others.

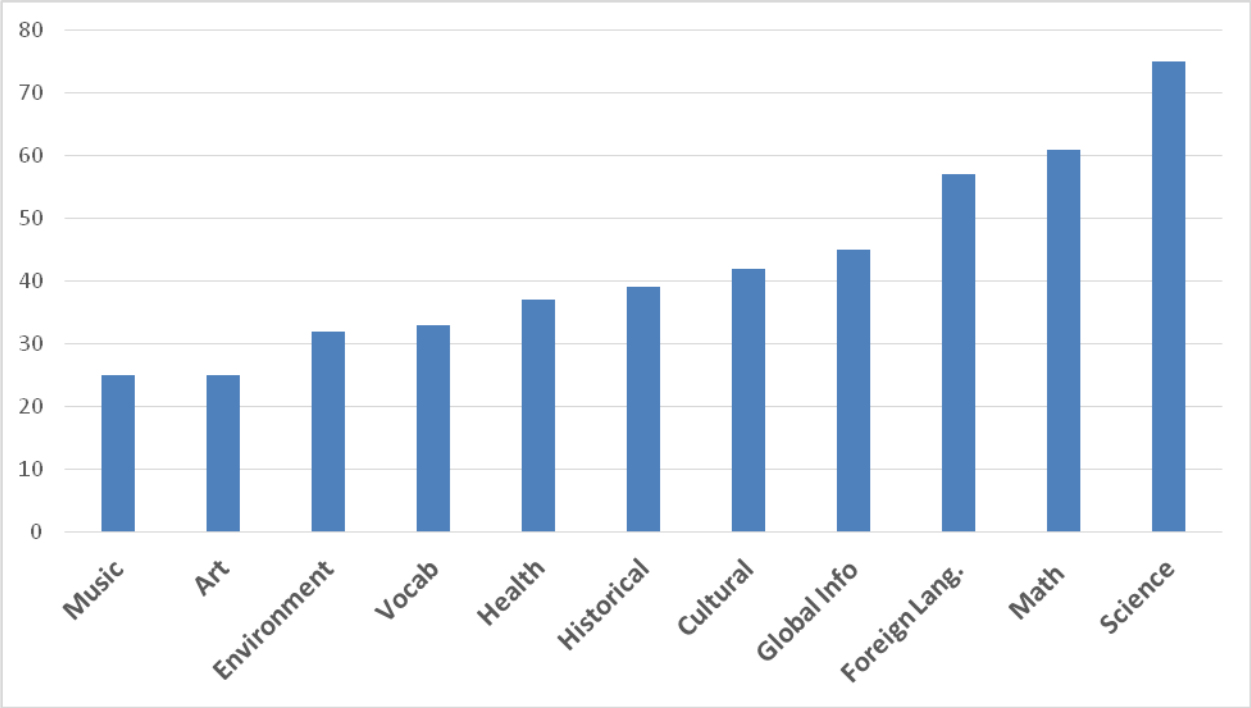


*Figure 5.* Specific skills respondents wanted to learn informally online

***(3) Learning Achievements Results.*** Not surprisingly, there were a range of actual accomplishments from informal learning pursuits (see Figure 6). Nearly everyone admitted to learning something new (88 percent). The next most selected response was feeling better about oneself as a learner after their open education experiences. More specifically, over 6 in 10 respondents indicated that their identity as a learner was enhanced (61 percent). Approximately half of the respondents indicated that their personal freedom, in general, improved. Over 40 percent felt better about themselves as human beings. Importantly, in the process, more than 37 percent changed their beliefs about learning as a result of informal learning pursuits. As might be expected, a fairly large percentage became interested in a new occupation or career (36 percent). More impactfully, perhaps, one in five claimed to have actually found a new job or position as a result of their informal learning experiences. A similar percentage received a certificate of some kind. Clearly, informal online learning had a powerful effect on the MIT OCW participants.

Less important, it seems, was keeping up with one's friends or making new friends. And while not huge, it is important to note that slightly more than 10 percent indicated that they moved up at work. Around the same percent of respondents noted that their self-directed learning pursuits helped them to score higher on standardized tests or exams.

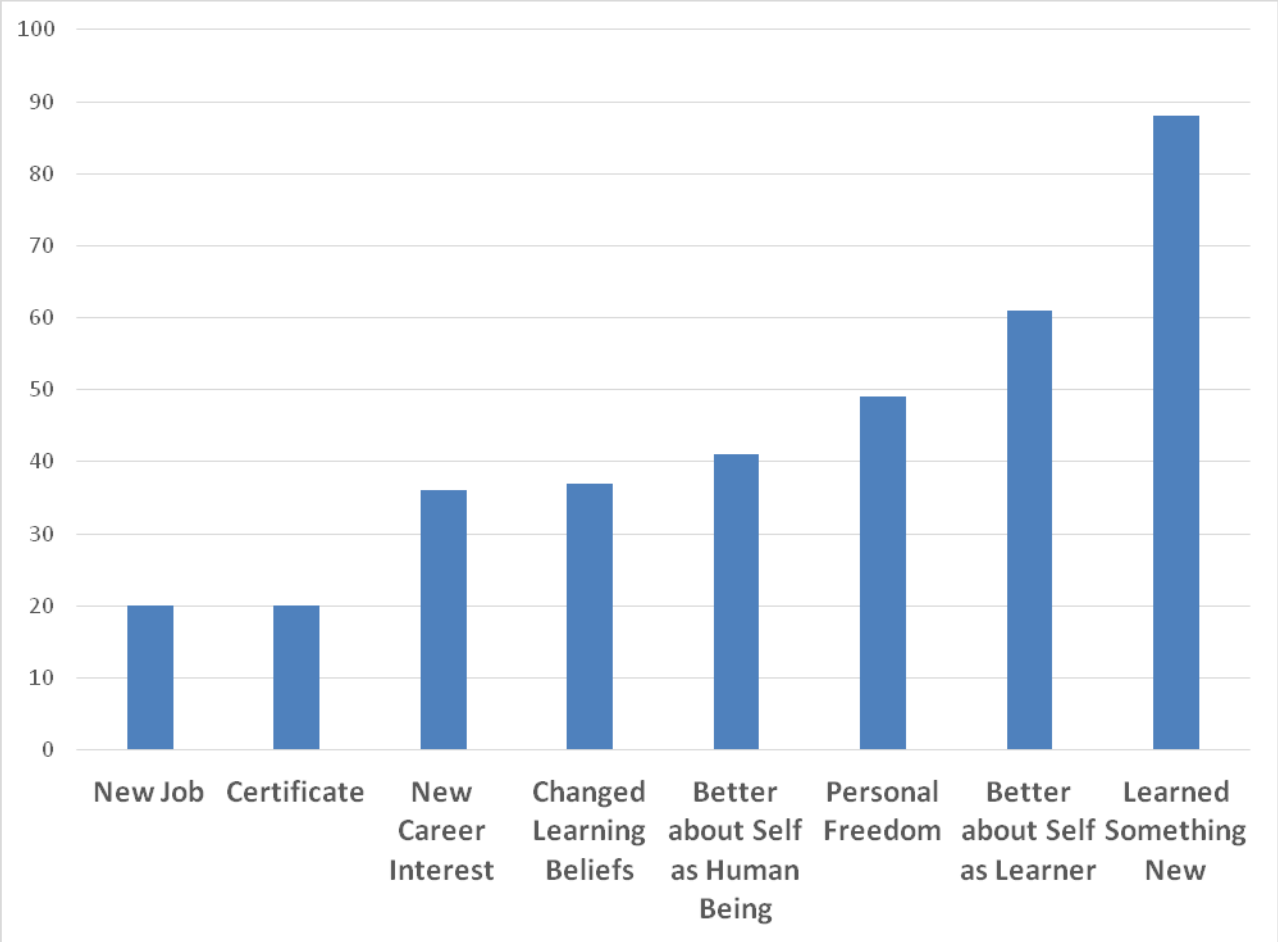


*Figure 6.* Achievements from informal learning pursuits

***(4) Obstacles and Challenges Results.*** As displayed in Figure 7, while many respondents had numerous self-directed learning successes, they also encountered significant obstacles and challenges when learning informally online. For instance, the most significant issue for exactly half of the respondents was a lack of time to use the resource. Such time constraints are often noted by those enrolled in MOOCs and other time intensive online courses. Other issues might include the lack of support within one's work environment for informal learning (17 percent), difficulty in using the site or service (23 percent), the lack of high quality open resources in a particular area (32 percent), and membership or technology fees (45 percent). In addition, 17 percent indicated a lack of access to the site or service, 14 percent had outdated or inappropriate technology, and 13 percent experienced firewall barriers. Other problems the respondents noted were a lack of personal motivation (14 percent) and lack of excitement to use the resource (9 percent).

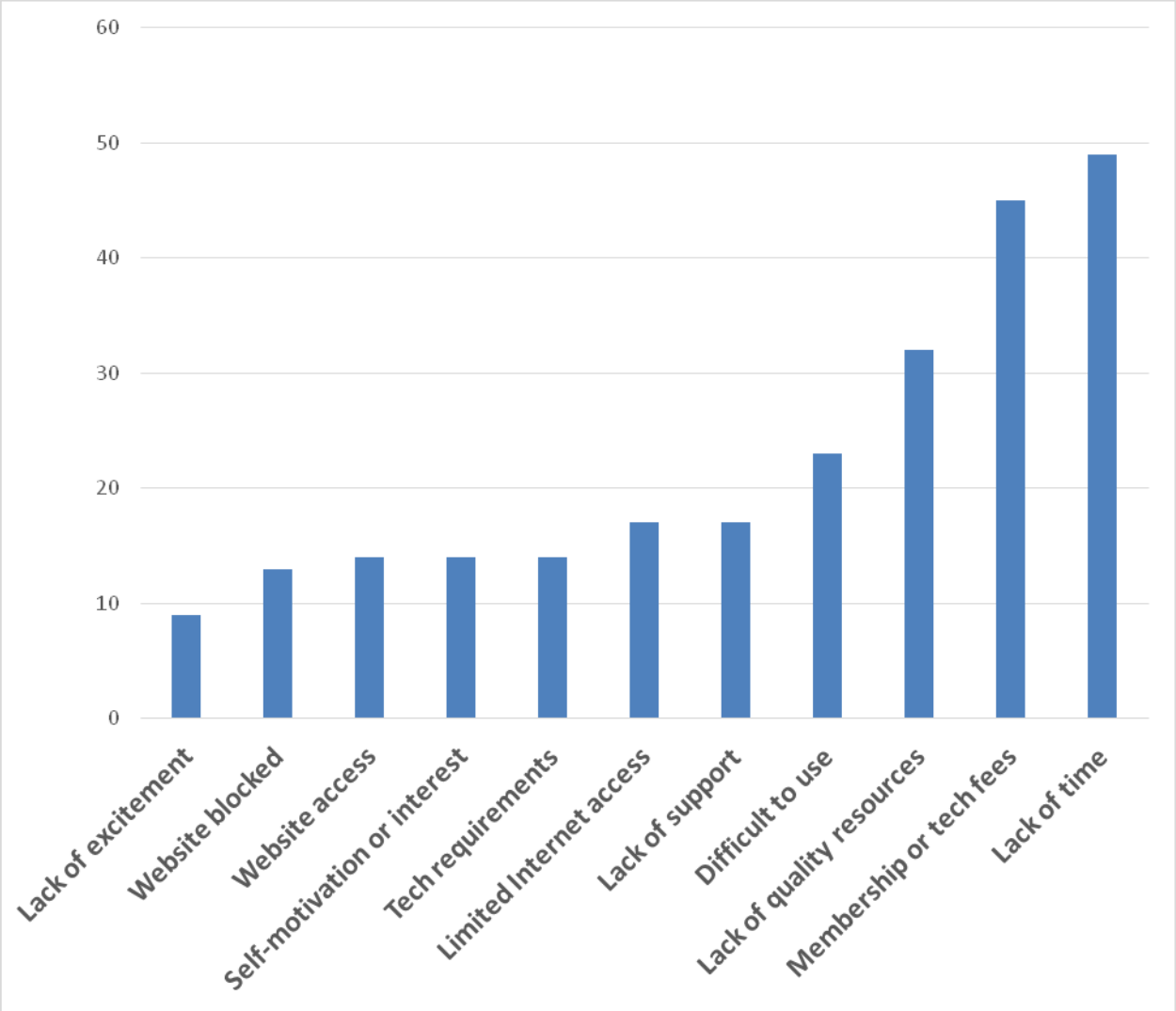


*Figure 7.* Obstacles and challenges faced when learning informally online

***(5) Possibility for Life Change Results.*** Among the most important findings from the survey was that the respondents experienced some type of life change from their informal learning pursuits. In fact, more than 75 percent of the respondents felt a sense of life change. Clearly, learning informally on the web has a major societal as well as personal impact. Another interesting finding was that those helping the respondents to learn informally online were friends, peers, and colleagues (43 percent), people they never met (31 percent), experts (26 percent), and teachers or trainers (23 percent). As open educational contents and courses expand online, informal learners will increasingly rely on support from experts and those who they may never meet.

## Qualitative Findings Related to Life Change across the Lifespan

The issues and topics detailed above related to the (1) learning preferences, (2) goals and motivations, (3) achievements, (4) obstacles and challenges, and (5) possibilities for life change

of self-directed online learners were further explored in the open-ended survey responses. In this manuscript, we only report those related to the final area of life change.
One way to understand the impact of OCW is to explore the qualitative data according to different age groups. There were numerous stories of life change embedded in the open ended data. Seven different ones are briefly detailed below based on age from those in their teenage years to people now in retirement who are starting new careers. These examples were selected to illustrate the varied reasons in which people access and learn valuable information from open educational contents. These are just seven stories from more than 600 that were collected in the open-ended survey items.

**Case #1.** 18-20 year old male from the Middle East.

**Result.** OCW inspires young people and can change entire educational systems.

> "When i was 14 years old i found MIT OCW during my search in..(physics) by Prof Walter Lewin looked really interesting and i became interested in physics. To be honest OCW changed my way of living and i found how beautiful physics is…informal learning is interesting because you can have access to some of the best courses provided by the best universities in the world…MIT OCW or Stanford open courses have also changed the educational system in some poor countries and have taught the teachers and professors in those countries how to teach a subject in a modern way."

As the quote above indicates, OCW developed for college students at MIT can be used by middle and high school students who normally would not have access to that information. Such materials can inspire young people into a career that they had not previously contemplated. They can also provide a sense of curiosity and wonder about a concept, theory, or entire discipline. Such individuals might later become advocates for the field who encourage their peers to learn about the content area. At the same time, the online videos and other resources from inspirational and engaging instructors can offer inexperienced instructors a means to learn new skills and teaching techniques. As such, informal learning can impact highly formal teaching and learning.

**Case #2.** 21-30 year old unemployed female from North America.

**Result.** OCW helps people become self-taught about social media and start new careers.

> "At first my purpose was to fulfill boredom …After graduating with a MS, I was faced with unemployment. I took the opportunity to read blogs, watch Youtube videos, and more to learn about blogging and social media. Since then I have become well versed in social media and other business topics and started a business… I decided not to pursue a PHD because I am learning a more rapid pace. Instead of spending 5 years in school, I can be flexible and work on what I am learning."

Many young people today remain unemployed after obtaining a college degree and many more are uncertain about their future. As the quote above reveals, OER and OCW offer a chance for such individuals to gain new knowledge and skills as needed without having to head back to college for a lengthy commitment such as pursuing a doctorate. Just-in-time learning available

through blog posts, podcast shows, online news, open access research articles, and YouTube and other shared online video resources allows self-directed learners to obtain needed information at the time and place most appropriate to their needs. Equally important, this abundance of open educational resources can accelerate the learning process. When that happens, much money can be saved on tuition. Many years previously spent in school can now be reallocated to making a contribution to society. And if success is attained, one's personal identity and self-esteem are enhanced.

**Case #3.** 31-40 year old male from Asia

**Result.** Self-Directed learning enhances jobs skills and new perspectives.

> "I learnt scheme from MIT OCW. Which helped in learning elisp/lisp. The programming techniques increased my software design knowledge. Algebra - mit ocw course was very useful, it helped me to refresh the basics of Digital signal processing. - I have learnt a lot of "applying my knowledge" than just learning the "theory" - Various online classes allow for multiple perspectives of the same topic thus showing us how the same thing can be applied in different fields."

Revealed in the quote above is an obvious use of MIT OCW. People search for content online that can elevate their status in a present job situation. Skills inadequately learned or long forgotten can be relearned. In addition, cutting-edge content such as the latest in computer programming can be acquired as needed and immediately applied on the job. As such, the self-directed learner can test and continue to refine the newly formed skills. This individual also points out that with multiple courses available online on the same topic, he can integrate multiple perspectives or ways that instructors teach a given topic.

**Case #4.** 41-50 year old male from the Middle East.

**Result.** Better prepared to reenter university life.

> "Most interesting experience of my own was my use of MIT OCW to refresh on Calculus. I purchased the textbook and followed one of several calculus options on the site. This was quite successful in re-introducing Calculus, as a prep to re-entering college 28 years after graduation - this time to study for a Master's."

The middle aged individual from the Middle East who is quoted above found his refresher course on Calculus to be an ideal course to prepare him for his upcoming enrollment in a master's program. Interestingly, he points to several options that MIT OCW offered to learn Calculus; he was not restricted to one set path or set of course materials. Instead, he could pick and choose from several resources or courses. As indicated earlier, having such choices is highly motivational and can foster a greater sense of personalization of learning.

**Case #5.** 51-60 year old female from North America.

**Result.** Open educational resources and open access to well-known people builds expertise and possibilities for a learning apprenticeship.

> "I'm a virtual reference librarian…My friend and I have a blog about music cognition, which is a little crazy because we don't know anything about it. Nevertheless, we blog about current articles, and one experience was especially meaningful, where I tweeted a question to Daniel Levitin, who answered. He's the guy who wrote The World in Six Songs, among other things. The fact that you can communicate with an expert in the field who will take the time to give a thoughtful tweeted (and yes, 140 characters can be thoughtful)--well, that's amazing…I think it was the single most exciting learning moment I've experienced."

Several things are interesting about this quote. First of all, this individual decided to create a new blog in an area in which she had limited skills and knowledge. Such a bold move might indicate that learning technologies like a blog can be the virtual napkin from which to explore one's emerging ideas and interests. What is even more interesting is that she received guidance and support from an established musical performer. In effect, in a highly self-directed world, our teachers might be people we never have met; including some we never would have imagined would respond to our queries. Feedback and coaching on our ideas can come from anywhere. This individual definitely was delighted by this unexpected support. As such events occur, learner intrinsic motivation is enhanced.

**Case #6.** 65 year old male from North America

**Result.** A retiree develops a new hobby through OER and OCW and that hobby requires still more skill.

> "I retired from education I became a lifestyle entrepreneur. I was trying to learn software to develop a business website for our sailing business. I discovered…Lynda.com. I was learning web development, video editing and photoshop. I realized that I could learn this software without going to a formal class and that was an "eureka" moment. My wife and I travelled and started a yacht delivery and training business that has taken us all over the world. We learned technology and social media as we travelled and ended up with many fantastic experienced in some very exotic places. We taught ourselves web development and have been figuring out online learning as we went. Now at 65 years of age we are going back to university to take a Computer Science Degree and start a new tech business relating to interactive educational media and games. All very exciting :-)"

As with the second case, online courses and OER can equip a self-directed learner with timely skills to be a successful entrepreneur. In this case, however, it is not someone starting a new career, but, instead, a husband and wife team who are retired. Their learning of web design and development as well as related skills has helped them develop a sailing business. Based on their extensive success, they have decided to enroll in a university for a degree in computer science. In effect, their informal learning has been so fulfilling that they are enrolling in formal education. Importantly, they are able to balance their various online knowledge pursuits and their building

of their new business. And they are doing so in their mid-60s. With OER and OCW, learning never ends; instead, a series of life paths can unfold across the lifespan.

**Case #7.** 70+ year old retired female from North America.

**Result.** New web design skills help a retiree showcase her talents.

> "I'm an avid photographer and have developed skills for developing my own website for display of my photography and books I have written that include my photographs…I've had multiple careers, from science, to public administration, and information technology. The development of my art is a new and exciting experience."

This final quote illustrates the use of OER and OCW across the lifespan. Those who retire or who pursue new hobbies need multiple access points to learning. Free and open online courses or even just a few modules can provide the skills needed to run a business (e.g., tax accounting) or acquiring skills needed to market or demonstrate one's talents as evident in this case. What is particularly interesting is that this 70+ year old former scientist and IT administrator is learning how to design a homepage on the web from course contents found on the web. Her art is a new career. With open educational materials, she can continue to develop those skills and explore new income producing and life satisfaction options.

These seven individuals provide an important glimpse into the potential for life change from open educational resources. They each represent a different age group or stage in life. Importantly, all seven experienced something significant as a result of learning online. Clearly, MOOCs, OCW, and OER can help in building, enhancing, or changing a career. Additional research is needed to ferret out the motivational components and support structures that can be embedded in open content to help larger numbers of people take advantage of open education.

## Recapping the Results and Conclusions

This study explored five main areas of self-directed learning of MIT OpenCourseWare newsletter subscribers, namely their: (1) learning preferences; (2) goals and motivations; (3) achievements; (4) obstacles and challenges; and (5) opportunities for life change.

***(1) Learning Preferences Recap.*** The survey results indicate that the paths and places for informal and self-directed learning are quite diverse. In the 21st century, people are engaging in self-directed learning when in cafes, airports, cars, and subways and trains, and even while hiking or walking, albeit less frequently than at home, work, school, or in a university.

In addition to the places and paths for self-directed online learning, the devices for informal learning are proliferating and becoming increasingly mobile. With the range of devices for accessing learning increasing, it is difficult for the designers of such learning to know how people might be accessing it. In addition, as the formats for delivery multiply, it places new demands on the designers of such instruction to offer potential learners multiple ways to find and use such information.

Not surprisingly, these learners are relying on open educational resources for their information needs. Most commonly, people tend to rely on common resources like Wikipedia and YouTube for their basic information needs. However, many other websites and resources were revealed as vital for informal learning online. Looking across these resources, it seems that online referenceware (e.g., Ask.com) is highly popular as are shared online video resources (e.g., How Stuff Works) and technology sites (e.g., Stack Overflow; a question and answer site for professional and enthusiast programmers). Online resources with the potential for life change included MIT OCW. Other life altering resources included the BBC online, iTunes University, the Khan Academy, TED talks, Coursera, edX, and Udacity along with Wikipedia and YouTube. What is interesting is that many of these resources are MOOC providers or OCW. The potential of open education such as OCW, therefore, is more than just acquiring new knowledge, skills, or resources; it can actually transform one's life.

***(2) Goals and Motivations Recap.*** The respondents had many reasons for seeking information online. One factor that was apparent was that people long for internal self-improvement and professional development. In terms of specific subjects or disciplines, math and science skills as well as picking up a new language were the most popular. From a motivational standpoint, the respondents were curious or wanted to fill a specific information need, though a significant number of them wanted to learn something that could help society. As humanists like Carl Rogers, mentioned earlier, and many scholars from the self-directed learning movement would have predicted, a key aspect of using open educational contents is personal freedom to learn as well as choice, control, and fun. Many self-directed learners also long to produce or create something; and, as noted in the qualitative data results, for some individuals this might even be a small business.

The qualitative findings of this study spotlight the possibilities for self-directed learning through informal education channels, including OCW, OER, and MOOCs. Documenting life changes from informal learning of open ended content can hopefully serve to inspire others. The findings of this research offer new insights into the lives of individuals attempting to learn from free and open resources on the web. There are myriad reasons why individuals around the world access OER, OCW, MOOCs, and other free and open educational resources to learn. As such resources proliferate, so, too, does learner choice and autonomy. Stated another way, when the resource pool increases, there are new opportunities for self-directed learners to explore, share, and obtain new skills and competencies. Most notable are not specific skills in a certain subject area, but the opportunities for life altering changes. Better understanding of the goals of these self-directed learners should help in the design of more engaging informal and extreme learning environments. Such insights might also play a role in supporting people who presently are not self-directed learners.

***(3) Achievements Recap.*** In terms of content related successes, our analyses of the data revealed that these learners amassed skills in physics, computer science, teaching, chemistry, business, law, and many other fields. However, there was no one resource that was pivotal to most learners; they learned through an assortment of online resources. In the open ended items, these individuals discussed their new sense of freedom to learn from a wide gamut of web-based tools and content resources. Many of our respondents truly enjoyed learning for the sake of learning,

without any associated external reward or certificate of accomplishment. They explored personal interests and found what is meaningful to them.

***(4) Challenges and Obstacles Recap.*** Self-directed online learning is not without significant challenges today. Among the key obstacles or challenges that respondents faced were the lack of time to utilize the vast resources at their very fingertips. Given the explosion of open educational resources, that should not be a revelation. What was more surprising was that the second biggest obstacle was not related to issues of access or firewalls, but membership and technology costs or fees. We had anticipated that OCW subscribers would primarily utilize free and open online resources. Other researchers might follow up on this cost issue, while instructional designers and instructors might provide better access to high quality free resources. Naturally, there was a concern about the quality of the materials found and the lack of support to use them once they were deemed of high enough quality to use. To address such concerns, Mishra and Kanwar (in press) as well as Swan, Day, Bogle, and van Prooyen (in press) offer quality assurance criteria and advice for those tapping into MOOCs and open education.

***(5) Possibility for Life Change Recap.*** While data analyses are ongoing, the vast majority of those that we surveyed felt a definite life change from free and open educational content. Given such results, we conclude that informal and self-directed learning, while not necessarily improving test scores, is playing a monumental role in society.

As noted earlier, respondents wanted to produce or create something. For instance, some started a new business or learned marketing or web design skills to expand an existing one. Others learned skills that helped them to overcome huge problems such as when a country imploded or was dramatically altered politically (e.g., Russia). In contrast, several of the respondents noted that while they did not experience significant life changes, they were extremely happy to keep up with changes occurring around them. Others felt that changes were more incremental than suddenly life changing. Still others felt momentous life change in the form of newly discovered freedom to learn, autonomy, and a sense of Eureka as well as greater confidence, happiness, and inspiration. Their personal transformation was psychological not informational or intellectual. For most, open education offered a sense of accomplishment that was not possible in traditional educational settings.

What this research project reveals is that people have specific career-related or personal interests that they can now enjoy at their own leisure. The web has tremendously expanded access to education and provided learning options that previously did not exist. In the midst of these new information access points and novel learning routes, there is much internal or intrapsychological change occurring that, for the most part, is positively impacting one's self-concept as a learner.

## Instructional Implications

There are several key implications from this research. Chief among these implications is that educators, instructional designers, and online learning tool and resource designers need to embed a sense of choice and control when creating or enhancing OCW, OER, and MOOCs. Some opportunity for personal fun and building or generating something is also important. Humans are

increasingly migrating to online environments for their learning needs. They are curious and want to explore how stuff works. Often it is not course credit, a transcript mark, a certificate, or a degree that they are pursuing. Instead of such extrinsic motivators, they want to pursue their personal goals and passions. Furthermore, they not only want personal growth and professional development as a means to enhance their careers, but many also want a chance to help others pursue their learning interests. As such, these self-directed learning environments might embed online discussion forums and learning communities that can foster such knowledge support and caring.

Instructional designers might design instructional scaffolds and other such guidance to help learners select high quality of the online resources. Already, Class Central, TechnoDuet, OER Commons, the MOOC List, and Open Culture exist to help sort through the mass of educational contents now available. As learners as well as educators in the coming years and decades come to embrace self-directed and informal learning paths, such guidance will be critical to learner efficiency and ultimate success. Self-directed learning perspectives and frameworks from Garrison (1997) as well as Song and Hill (2007) might help in that regard. In building on such efforts, Kop and Fournier (2010) conclude that in an age of MOOCs and OER, learners will require more sophisticated tools and resources to help them evaluate the viability of information available for their self-directed learning pursuits.

## Study Limitations

In the midst of these interesting results related to life change or impact, there were several key limitations that should be pointed out related to this particular study. First of all, the survey respondents were subscribers to a newsletter related to MIT OCW. It is likely that many or most such individuals have extensive self-directed learning experience from open educational contents, thereby limiting the generalizability of the findings. Along these same lines, it was not unexpected that subscribers to MIT OCW would have a preference toward math and science content; however, that undoubtedly does bias the results. Third, 44 percent of these respondents were from North America where access to the Internet is typically higher relative to most other countries and regions of the world. Fourth, one should also keep in mind that these MOOC participants volunteered or self-selected into the study. A fifth limitation was that of the 156,000 active subscribers to the MIT OCW newsletter, only 1,429, or less than 1 percent, responded to the survey; about half of which completed the open ended items. Finally, as a mixed methods study, only a portion of the extensive and highly interesting qualitative results could be included here due to length limitations.

## Final Reflections and Future Directions

It has been a little over a decade since Charles Vest's courageous announcement about all courses from MIT being made available for free use online. The educational world has changed dramatically since that time. Not only are millions more people learning online in every educational sector—K-12, higher education, and corporate, military, and government training settings—but informal learning has simultaneously proliferated. The movement toward a more

open educational system has shifted to highly massive endeavors that are prominent in the news such as MOOCs. As open education rises in salience, most institutions of higher learning are deliberating on next steps. Some are struggling to come up with plans and solutions that incorporate open education contents and courses and nurture self-directed learning on an ever increasing scale. At the same time, for economic, political, and social reasons, some states and universities are quickly sponsoring MOOCs and other related open education initiatives.

With educational institutions and organizations shifting resources toward more free and open contents, there is a pressing need to understand how to foster productive self-directed learning from OER. First the characteristics of self-directed learners and processes of self-directed learning need to be better understood. Second, as these traits are uncovered, training programs on self-directed learning might be designed. In addition, self-directed learning supports or scaffolds might be embedded in OER or MOOCs at key moments in the learning process or made available upon demand. And, as indicated earlier, professional communities of self-directed online learners might be formed and supported.

Without a doubt, as with President Kennedy and his dreams to explore space four decades earlier, Charles Vest ushered in this new age of open education and self-directed online learning with his bold announcement back on April 4, 2001. Unlike Kennedy, Vest fortunately lived to witness firsthand the substantial fruits of his ideas before passing away on December 12, 2013 (Brant, 2013). By that time, thousands of MIT open courses had been accessed by more than 150 million learners around the globe. Moreover, the popularity of OCW has inspired hundreds of additional colleges and universities to enter the OCW movement, establish e-learning programs, and experiment with MOOCs and other types of open courses.

Vest certainly will not be the last leader or figurehead of the open education movement, but with one small step, he and others at MIT took the first gigantic leap for the free and open education of humankind. Back in 2001, we no longer needed challenging goals related to exploring outer space as in Kennedy's days; instead, Vest wisely envisioned how traveling within a virtual space could open up the entire educational world to places never previously experienced or touched. As the findings of this study testify, that mission was definitely accomplished.

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