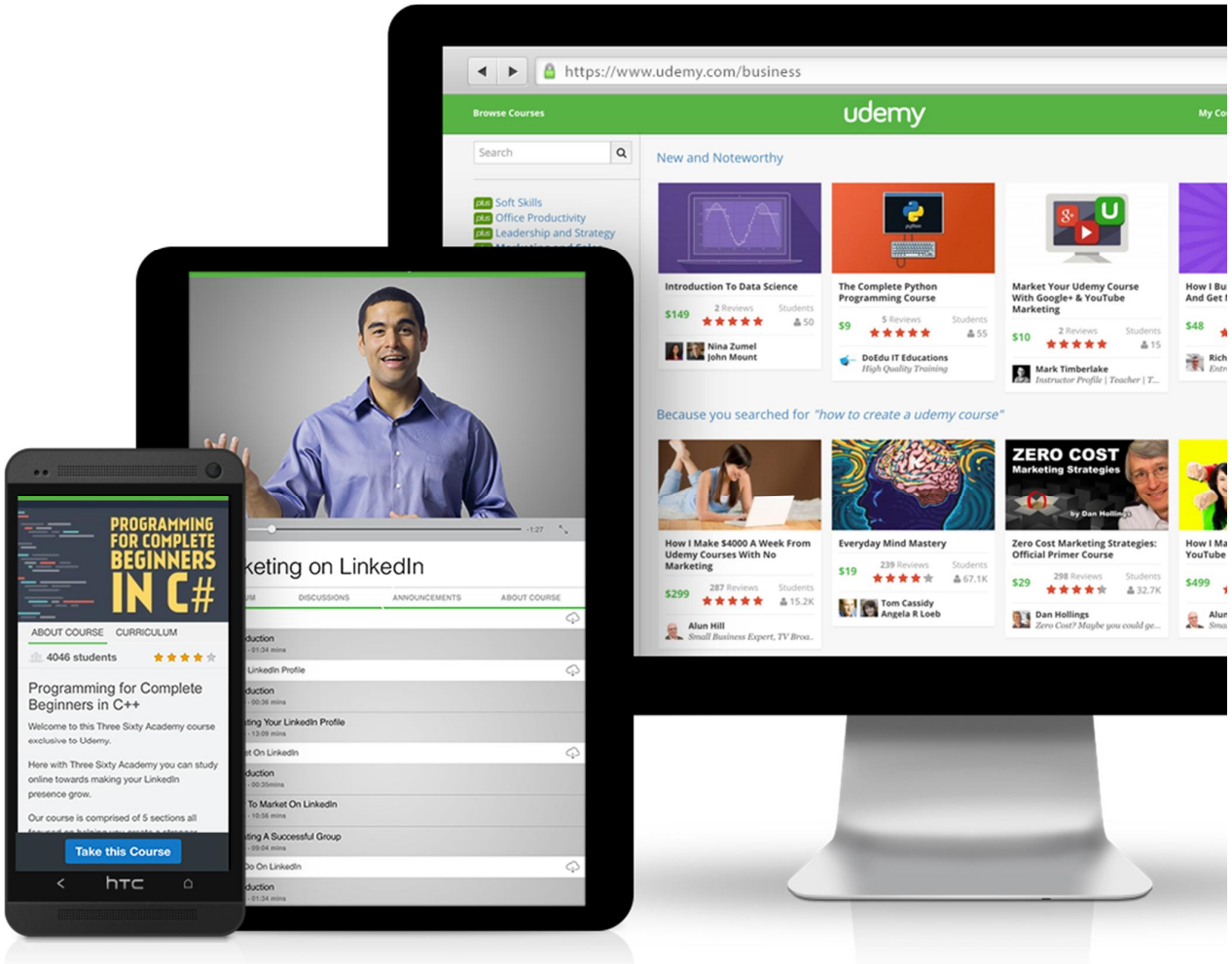
Meeting the Upskilling Demands of the Singapore Workforce through MOOCs

A White Paper by Udemy and Dioworks

(Parts 1, 2 & 3)



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The 2016 White Paper on MOOCs is a collaboration between Udemy and Dioworks Learning, Singapore, an innovation and e-design centre to drive e-learning globally.

The research behind the White Paper is conducted by the Udemy research and curriculum development teams and analysed and crafted by Dioworks Learning. The strong support from Udemy's teams is gratefully acknowledged and appreciated. To learn more about Udemy, visit www.udemy.com; to learn more about Dioworks Learning, visit www.dioworksgroup.com.

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Purpose of the White Paper

Set in the context of current global shifts towards e-learning and Massive Online Open Courses (MOOCs), this white paper seeks to inform policies and business strategies concerning workforce upskilling and reskilling in Singapore with data collected from Udemy and other MOOC platform providers such as Coursera and edX.

To provide some comparative data, the demographical profiles, learning and purchasing behaviour of Singapore-based learners on Udemy are reviewed against the global learner profiles and behaviour when accessing MOOCs on other platform providers.

Introduction

The global learning landscape is undergoing a tectonic shift beginning with higher education (e.g. premier US universities) in 2011/12 leading the way in making their programmes available online, many of them without any fees attached. While distance and e-learning programmes are not new, internet access and speed, ease of use and the learning experience for these programmes seem to have improved dramatically in recent years. High resolution video clips can now be viewed with clarity and little lag, resulting in more options for curriculum designers to push innovative learning resources. Web2.0 has also contributed to more interactivity for the learners with many participating in collaborative projects and learning online.

There is also the element of learner readiness. Given that many of the digital natives are now in their twenties and thirties, there is a critical mass of learners who are not just ready to embrace, but expect technology-assisted learning as part of their upskilling process.

To meet their expectations, it is now almost incumbent of training providers and educational institutions to offer some rich media-infused learning when working with adult learners.

In addition to the shifts in learner mind-sets and learning technologies, workload intensity has also inched up over the years with more Singaporean workers chalking longer work days. Hence, finding time for training is a challenge. Due to manpower constraints to manage the daily operations, companies also find releasing workers for classroom training a concern.

This was raised in parliament in 2014 by the then Senior Minister of State for Manpower, Dr. Amy Khor:

> *… many SMEs also gave feedback that the tight labour market made it difficult to send workers for training. WDA will thus enhance the ETS (Enterprise Training Scheme) to support e-learning and mobile learning … This will provide more flexible training options for workers and … reflect learning in a digital age.*

While the Singapore government is providing support for e-learning, the extent to which technology-assisted learning can play a part in alleviating the time constraint issue without compromising learning effectiveness is unclear. To develop the individual adult learner, it may be necessary to consider a blended approach (NMC Horizon Report, 2015) where classroom training and work-based learning will be needed to inculcate values and ethical considerations for a particular job role. The role of e-learning could be to infuse media-rich cognitive stimulus to broaden the contexts of learning and application for that same job role and beyond.

...there is a critical mass of learners who are not just ready to embrace, but expect technology-assisted learning as part of their upskilling process.

The share of resident employment for PMEs (Professionals, Managers, Executives) was 31.2% in 2012 (Ministry of Manpower, Singapore, 2012) and going forward, it is estimated that as high as 50% of the Singapore workforce will be belong to the PME segment by 2020. The government recognises that technology usage can play a role in equipping this highly qualified and tech-savvy segment of the workforce with new skillsets.

This document will address the current e-learning phenomenon taking place globally and in Singapore especially pertaining to the advent of Massive Open Online Courses (MOOCs) and its use to upskill the workforce. The issue of how acquisition of work-related skills and knowledge critical for the professionalising of the individual worker to move up within the industry or move across industries can be facilitated by blended learning or e-learning through MOOCs will be discussed.

This report comprises the following sections:

Introduction: MOOCs as a Global Phenomenon

Part 1: Demographics of Singapore Learners on Udemy: *Who are These Learners?*

Part 2: Online Learning Behaviour of Learners from Singapore: *How do They Learn?*

Part 3: Online Learning Communities in Singapore and Other Countries: *How Different is Singapore Compared to Other Countries?*

The report begins by comparing the findings from different pieces of research literature on global MOOC platform providers, followed by findings from a case study on Singapore learners participating in Udemy courses. The data shown are collated from the literature, as well as surveys and interviews conducted by the Udemy learning analytics team from 2014 through 2016. The third part of the report locates the various learning communities in eleven countries based on their Community Activity Profiles (CAP).

MOOCs as a Global Phenomenon

Interestingly, 2012 was declared by New York Times to be the "Year of the MOOCs". Since then, the number of MOOCs (Massive Online Open Course) and online courses offered by experts, training providers, universities and institutes has been growing exponentially. These online courses can be fee-paying or free and rely on various business models to fund the development and delivery channels. A report by Allen and Seaman (2014) detailing the survey findings involving more than 4,700 US colleges and universities, estimates about 412,000 more US students enrolled in an online course in fall 2012 than the year before. The total online enrollment by US students reached 7.1 million students then. See Figure 1. below.

While the figure shows rising numbers of student enrolment in the United States up till 2012, there are indications that this trend is continuing although at a slower rate even up till the present. Local universities such as Nanyang Technological University (NTU) and National University of Singapore have embarked on developing their own online learning programmes. NTU plans to develop up to 1500 online courses by 2020 to drive their 'flipped classroom' pedagogical approach (NTU, 2015) in addition to the MOOCs they already have online.

Interestingly, 2012 was declared by New York Times to be the "Year of the MOOCs"

According to Sandler Research (2014), the global market for MOOCs will continue to grow at a compound annual growth rate of 56.61 percent over the period 2014-2018, based on data from key training providers and industry stakeholders such as Udemy, Coursera, edX, Udacity, Apple, Codecademy, FutureLearn, Iversity and Khan Academy.

The researchers found that growth of the global MOOC market is driven by several factors, primarily the rising cost of education and training and a better quality of education through MOOCs. On the other hand, the study also listed the lack of college credits or certifications in some MOOCs as possible constraining factors to the growth of the MOOC market.

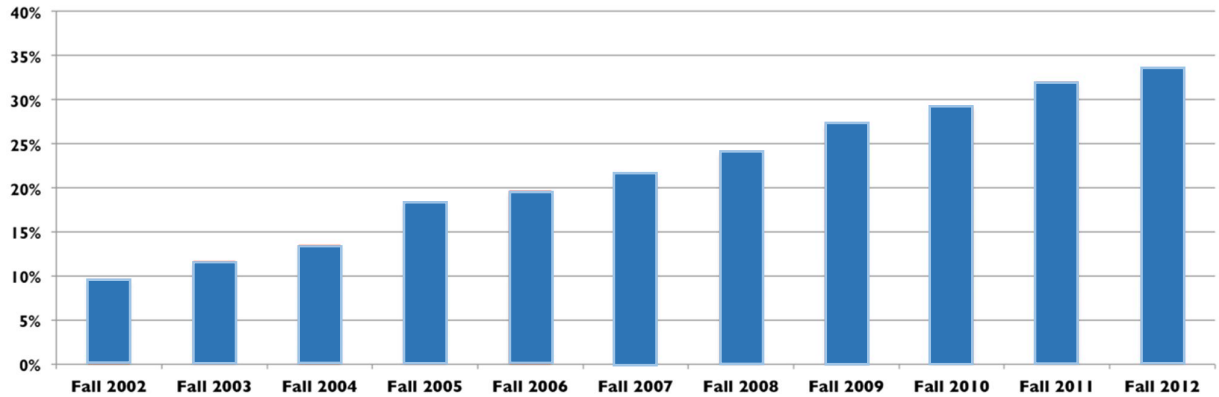


Figure 1. Rising Online Enrolment of Students in the United States as a Percentage of Total Student Enrolment in Traditional University Courses

Who Takes MOOCs?

In their study on the demographics of MOOC students, Christensen et al. (2013) used data provided by students participating in MOOCs developed by Penn University on Coursera. They found that MOOC students generally have very high levels of educational attainment with 79.4% of students possessing a Bachelor's degree or higher and 44.2% with a postgraduate degree, far surpassing the general educational attainment in their own countries (see Figure 2).

The study by Christensen et al. (2013) reveals that in addition to being highly educated, the MOOC population tends to be young, male and employed (See Table 1). Over 40% of MOOC students are under 30 years of age, with less than 10% over 60. Significantly more males (56.9%) than females take MOOC courses ($p<0.001$).

		Total (34,779 respondents)
Gender	Male	56.9%
	Female	41.3%
Age	Under 30	41.1%
	Over 30	58.9%
Employment	Student	17.4%
	Part-time employed	6.9%
	Full-time employed	50.0%
	Self-employed	12.4%
	Unemployed	6.6%
	Retired	6.8%

Table 1. Gender, Age and Employment Profile of MOOC Students Taking Penn MOOCs on Coursera

More than half (62.4%) report being employed full-time or self-employed, while only 13.4% report being unemployed or retired.

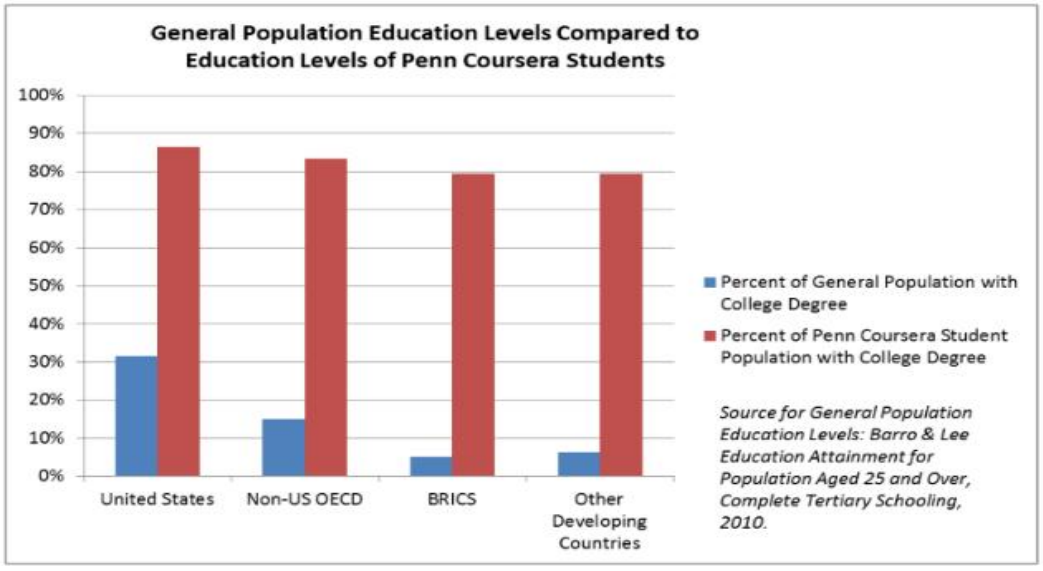


Figure 2. General Population Education Levels Compared to Students Taking the Coursera MOOC by Penn University

In contrast to Christensen et al. (2013)'s study, Ho et al. (2014)'s report highlights that on average, only 29% of edX students were female, compared to 41% at Coursera. It would appear that student demographics does vary across course topics and course providers.

This observation can also be made based on data from 17 MOOCs delivered by HarvardX and MITx in 2012 and 2013 on the edX platform. The findings (Ho et al., 2014; Hansen & Reich, 2014) show considerable differences in average demographics across courses, in terms of gender (13%-49% female), college degree attainment (54%-85%) and median age (23-30). For example, students in humanities courses are four times as likely as those in engineering courses to be 40 years old or older. At the same time, female participation may dip to below 20% for engineering and computer science MOOCs (see Figure 3. as depicted in Newman & Oh (2014)'s article).

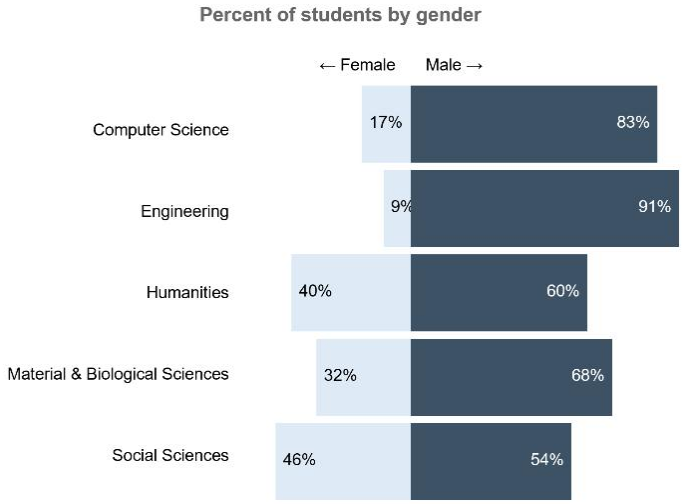


Figure 3. Gender Profile of Students Taking Penn MOOCs on Coursera by Subjects

The results from these two studies by Christensen et al. (2013) and Ho et al. (2014) show that demographical profiles of students also vary depending on the country they come from, the nature of the courses they participate in and the course providers offering the programme.

... the data showed considerable differences in average demographics across courses ...

Hence, understanding the profiles of students participating in different types of MOOCs is important to accurately inform policy and business decisions, based on appropriate datasets.

Specifically, for Singapore training organisations and government agencies looking to understand and address the learning behaviour of the Singapore workforce on MOOC platforms, it may be more appropriate to examine adult learners from Singapore participating in online courses for professional capability development as compared to courses with a more academic slant.

Looking to Online Courses to Upskill the Workforce

Deloitte (n.d.) posits that the market has evolved since the pioneering days of university-led MOOCs in 2011. Some MOOC providers are experimenting with partnerships to create academies and content portals for corporate clients and experiencing some success. For example, the Infocomm Development Agency, Singapore (IDA) successfully collaborated with a MOOC provider in 2014 to provide coaching sessions to Singaporeans participating in the Data Analytics MOOC offered by Johns Hopkins University. The Institute for Adult Learning, on the other hand, independently mounted and delivered four MOOCs successfully to reach out to more than 2000 adult educators on Canvas and Udemy platforms in the first half of 2015.

In a Future Workplace survey conducted in 2013 and completed by 195 corporate learning and HR professionals, 70 percent of the HR professionals who responded indicated that they saw opportunities to include MOOCs in their own company's learning portal, leading to either e-learning or blended learning programmes (*www.futureworkplace.com*).

The HR professionals in the study made six recommendations on how MOOC providers could adapt to the needs of adult learners. (See Figure 4. below) The results indicate corporate learning requirements which online training programmes should address. This includes customising the content to match the workplace context, learning for work performance and brevity in their designs. Based on these requirements, the typical MOOC offered by universities which lasts 10 to 15 weeks, with in-depth theoretical content, may not quite match the 'less academic offerings' requested for by HR professionals for their staff. Given these recommendations, especially on the nature of the course offerings, it may be that MOOCs that are offered by industry experts and shorter in duration will provide a better fit with corporate training and adult learning needs.

70 percent of the HR professionals ...indicated that they saw opportunities to include MOOCs in their own company's learning portal

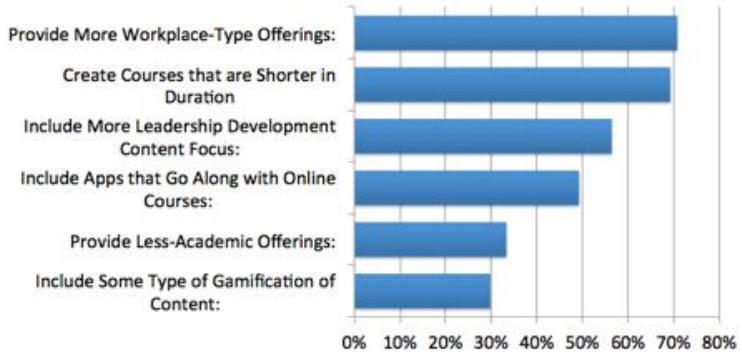


Figure 4. Chart Showing Areas of Adaptation to MOOCs to Meet Corporate Learning Requirements

Case Study: Udemy

Udemy started offering its platform for instructors and learners to use in 2010. Deloitte (n.d.) reported that MOOC platforms such as Udemy provided expert practitioners the opportunity to offer their content online "… so the MOOC market, which originally started in higher education, is rapidly expanding into corporate and personal learning as well." Likewise, Wilson and Gruzd (2014:p.1) posit Udemy as one of "the leading MOOC providers in 2014" with the comment that MOOC platforms "… share the goal of facilitating learning for unlimited audiences at no cost or minimal charge, overcoming socioeconomic hurdles and opening education to all."

Compared to MOOCs offered by Coursera and edX which can be lengthy (stretched out over 10 to 15 weeks) and academic, Udemy MOOCs average 6 to 8 hours and are segmented into short video clips of 3 to 20 minutes each. Comprising many video clips, each MOOC allows learners to return to the last viewed clip to continue with the learning. Primarily, the Udemy platform is designed to make learning convenient and easy. Based on data from Alexa.com, a web business analytics site, the

… Udemy platform is designed to make learning convenient and easy.

majority of Udemy users access the portal from home, followed by work and in schools (see Figure 5.). It gets really interesting when we realise that most of these adult learners who access the MOOCs at home, actually work in the daytime and are using the MOOCs for upgrading skills on their own time! The data on the reasons for accessing MOOCs will be shared in Parts 2 and 3 of this report but it suffices to say at this stage that individuals are aware of the need to upgrade and the short, practical and work-related courses on Udemy, mostly shared by individual experts, help make the learning more manageable and achievable.

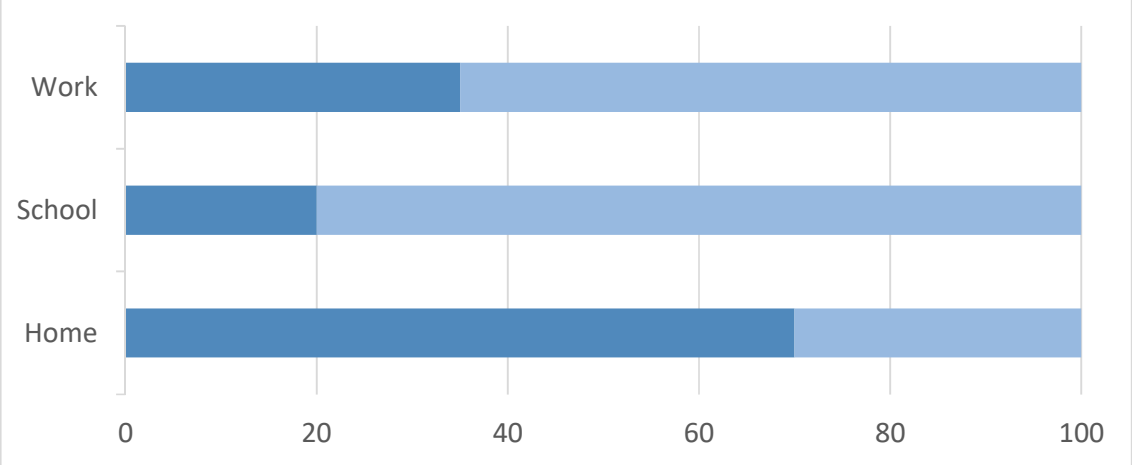


Figure 5. Chart Showing the Ratio of Udemy Users Accessing the Courses from Different Locations

Brief Description of Udemy

Udemy positions itself as the global marketplace for education. Based on statistics on www.udemy.com, there are more than 11 million students, 20,000 instructors and 40,000 courses on Udemy. It has grown exponentially, fueled in part by the organic increase in experts being willing to share their knowledge and experience online with others; and in part, by an extremely user-friendly platform with features that facilitate uploading of instructional videos and the formulation of quizzes. With the split between professional development courses and personal enrichment courses at 70% and 30% respectively, Udemy appears to have a good mix of learning programmes for serious and recreational learners.

At the same time, Udemy presents a unique value proposition to instructors who may benefit from sharing their expertise on the platform. At an average of US$30 per course, the top 10 Udemy instructors have garnered sales of up to US$17 million and the average annual earning per instructor is US$7000.

...there are more than 11 million students, 20 000 instructors and 40 000 courses on Udemy

See Figure 6. for quotations from two of Udemy's more popular instructors. The revenue for instructors is expected to grow as the quality of the courses improve and the number of students increase.

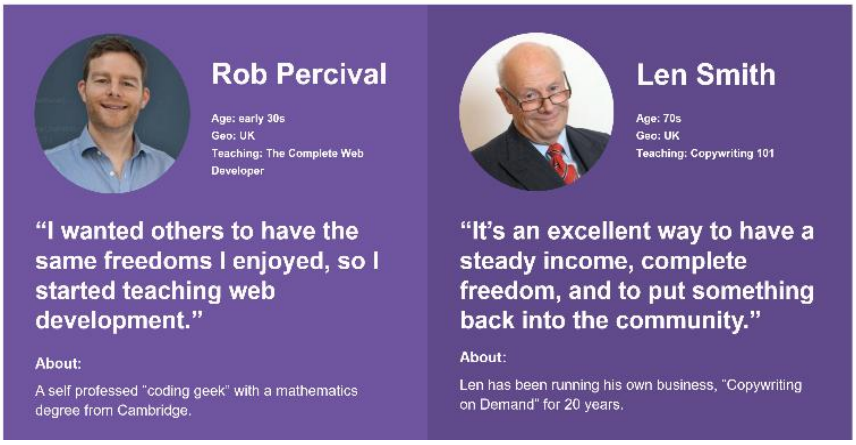


Figure 6. Reasons from 2 Udemy Instructors on Why They want to Share Their Expertise Online

Part 1: Demographics[1] of Singapore Learners on Udemy

Gender and Age

The changing educational landscape at the global level also reflects the transformations at the local level as to how Singapore adult learners are accessing information and learning content online. Despite concerns from the ground on how Singapore adult learners do not seem to be learning online, the data shows that there are **65,889** registered users and **45,830** learners enrolled in courses on Udemy (as of Oct 2015) are from Singapore alone. Of these learners enrolled in Udemy courses, the majority of them are males (79%) and in their 20s or 30s (see Figures 7 and 8 below). This proportion is similar to the demographics of global learners accessing Udemy courses (80% male and 20% female).

While there is a good spread of learners across the various age groups, the bulk of the learners, unsurprisingly, tend to be Generation Ys and the Millennials, the groups usually termed as 'digital natives'. The age and gender profiles of the Udemy learners from Singapore seem quite comparable to the age profiles of global learners on Udemy (27% between 25 and 35 years old and 27% between 36 and 45 years). Compared to Coursera and edX (median age at 26 years old and mostly male),

... there are 65 889 registered users and 45 830 learners enrolled in courses on Udemy are from Singapore alone.

the Singapore learner seems slightly older, possibly due to the wide range of professional courses found on Udemy, which addresses job skills and work requirements in Singapore.

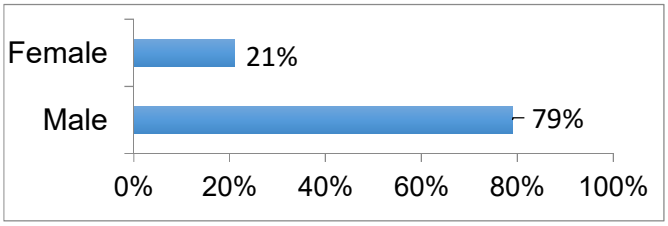


Figure 7. Gender Proportion of Learners Enrolled in Udemy MOOCs

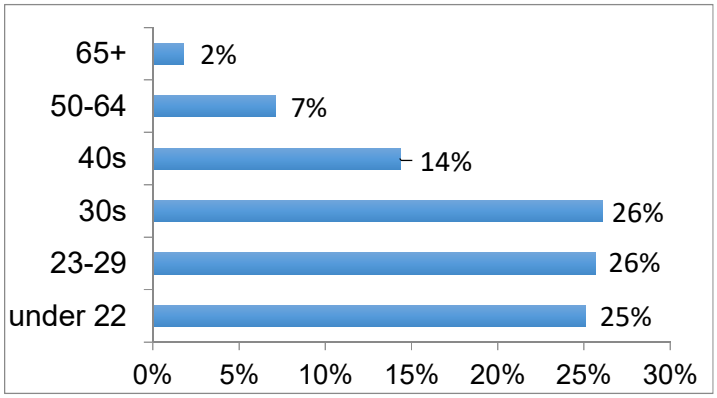


Figure 8. Age Profiles of Udemy Learners

[1] Based on 2014 survey findings from 727 Singapore-based respondents

Part 1: Demographics of Singapore Learners on Udemy

Educational Qualifications

Generally, the younger generation in the Singapore population is better educated so it is reasonable to expect the educational qualifications of these learners to be at graduate or postgraduate levels. However, compared to the 79.4% of graduate and postgraduate learners reported in Christensen et al. (2013)'s study of global learners, there are only 63% of Udemy learners from Singapore with the corresponding qualifications. It is possible that the professional and bite-sized courses on Udemy are able to address the needs of Singapore learners with lower qualification levels compared to courses on Coursera and edX.

It is encouraging that a substantial 20% of the learners with technical or polytechnic qualifications are also participating in Udemy courses. Further examination of the data may be necessary but at this point in time, it is useful to note that there are courses on Udemy which meet the work needs of a generally pragmatic group of learners with technical and diploma qualifications. It may not be far-fetched to infer that the appeal of online learning to the segment of the population with lower formal educational qualification could be due to the accessibility and diverse range of available courses for upskilling. Going forward, online learning and certification could be a mechanism for formally quantifying the learning of this segment of the workforce and thus, improving their employability.

It is possible that the lower qualification levels of Singapore learners on Udemy ... may be due to the availability of a wide range of courses including those which are less academic and more work-related.

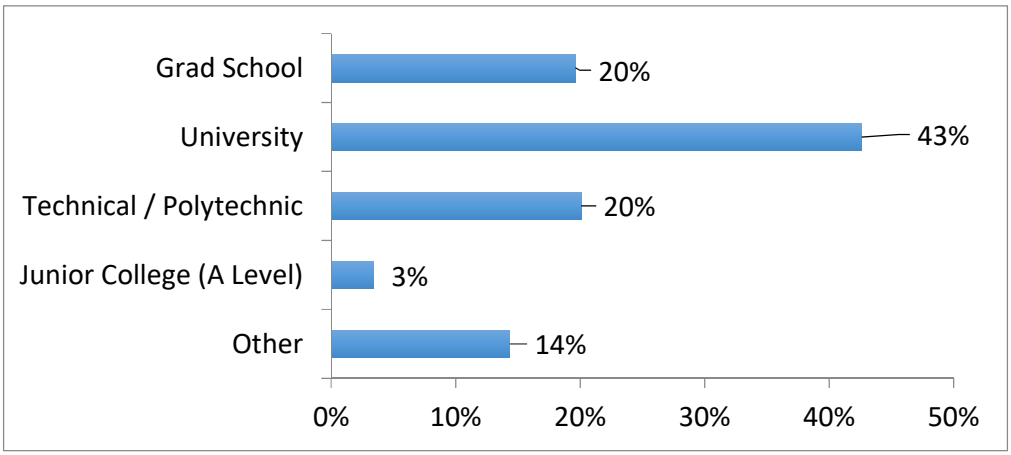


Figure 9. Qualification Profile of Udemy Learner

Part 1: Demographics of Singapore Learners on Udemy

Current Employment Status

Interestingly, Udemy learners from Singapore constitute a higher percentage (24%) of school-going students compared to Christensen et al. (2013)'s study of global learners with 17.4% of school-going students. In contrast, a large proportion (43%) of Udemy learners from Singapore are in full-time employment staff with another 14% and 9% being self-employed or freelancing respectively, compared to the Coursera cohort at 50% of learners in full-time employment and 12.4% being self-employed (see Figure 10.). There is also a small but important group of learners (at 5%) who are unemployed and looking for work in Singapore so it is encouraging to see them picking up skillsets in the MOOC space. More research is needed to determine their learning needs and at the same time, what can be done to emplace them in a job while or after they have completed their learning online.

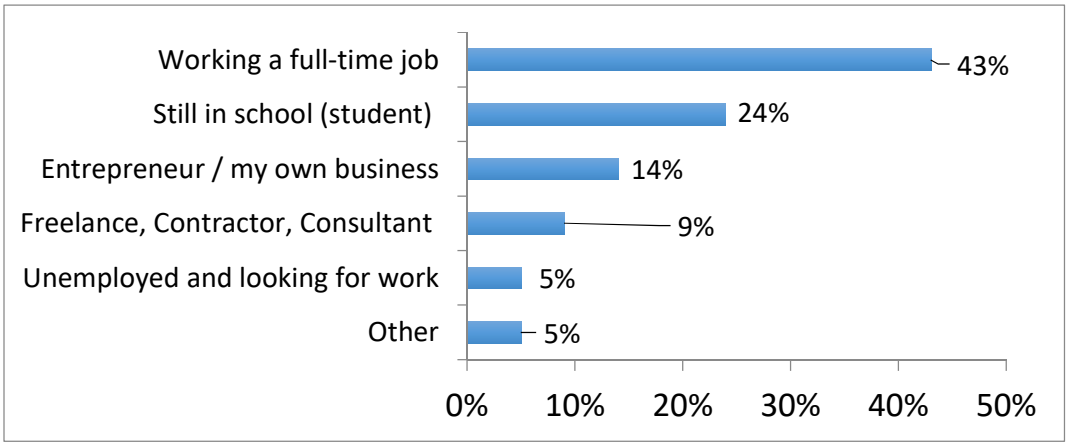


Figure 10. Employment Profile of Udemy Learners

Part 1: Demographics of Singapore Learners on Udemy

Income Bracket

Singapore learners indicated a wide range of income levels (see Figure 11.), with 19% earning more $70K SGD. Another 28% of Singapore learners have incomes ranging between S$20K to S$70K and together with the unemployed, this group deserves some attention, especially where upskilling opportunities are concerned. Finally, it should be noted that the under-20K income bracket is inflated as 24% of the user base is still in school, as shown in Figure 9. It may also be possible that some learners may under-report their income to keep their actual revenue confidential.

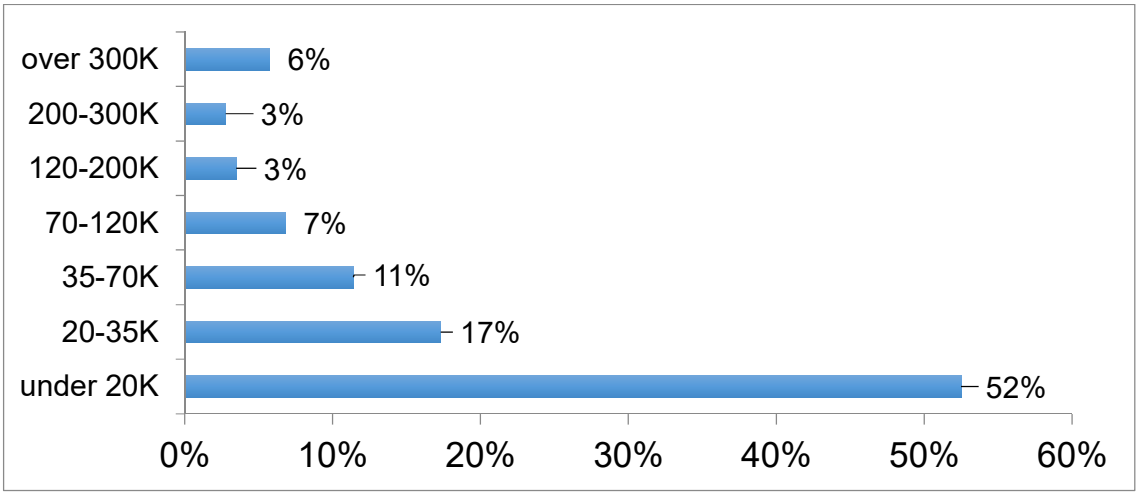


Figure 11. Income Bracket of Udemy MOOC Users

Part 1: Demographics of Singapore Learners on Udemy

What Does the Demographic Data Mean?

It is significant that the current demographic profile for Singapore learners participating in Udemy courses indicates a persona that is essentially a male in his late 20s or 30s, with a Bachelor's or Master's degree and working in a full-time job. The possible reasons for this profile will be discussed in Parts 2 and 3 (to be disseminated in the coming months) but the implications are that with 45,830 Singapore learners on Udemy alone and possibly many learners on other MOOC platforms, it presents a compelling case for the government and training organisations to consider policies and initiatives to target these MOOC learners for upskilling purposes. In their late 20s to 30s, these learners are relatively young, possibly with only a few years of working experience and will be in a position where reskilling and upskilling are important for career development. The other group of learners which deserves some examination is our female workforce. The low participation rate of female learners across different MOOC platforms may be of concern, especially with regard to upskilling opportunities for women. Perhaps, developing more MOOCs addressing certain fields of work where female staff are more prevalent such as nursing or teaching may encourage more female learners to enrol and engage in MOOCs.

Conclusion and Implications for Part 1

The first part of the report focused on the context for the global transition to e-learning or more specifically, learning via MOOCs. Considering that MOOCs are a relatively recent phenomenon over the past 5 years, the explosive increase in learner base across the world and in Singapore has been an eye-opener with regard to the educational needs of our global population. Whether MOOCs are the answer to some of our educational issues remains to be seen but what has been exciting is how learners have taken to some of these MOOCs to close their learning gaps. Going forward, MOOCs will likely evolve to closely match the local needs and contexts of our Singapore learners and to provide a better learning experience for our adult learners.

MOOCs will likely evolve to more closely match the local needs and contexts of our Singapore learners to provide a better learning experience...

The profile of Singapore learners on Udemy seems to indicate that they are digital natives in their late 20s and 30s and are using MOOCs to meet their learning requirements. Understanding the types of learners and their motivation for using MOOCs and the online learning behaviour they exhibit will be important and interesting. These topics will be discussed in the upcoming parts two and three of the report.

Part 2: Online Learning Behaviour of Udemy Users

Part 2 of the White Paper by Dioworks and Udemy focuses on the learner's experiences and behaviour when undertaking online courses. With the rapid, phenomenal rise of MOOCs as an avenue for education and training (Christensen et al., 2013), developers of online courses have a much stronger incentive to ensure that content stays relevant, pragmatic and engaging for learners. Online hosts of such courses (e.g. Udemy, Coursera) must also continually work towards a user-friendly interface that is supportive of learning and promotes a positive learning environment. To achieve this objective, individual learner characteristics need to be taken into consideration to facilitate effective learning; differing learning preferences require online courses to provide adaptive and balanced learning opportunities to match these preferences where possible.

What exactly are these learning preferences of learners in Singapore? To what extent do the online courses meet the learning preferences of learners in Singapore? This paper, using Udemy as test case, aims to address these questions. Based on a survey sample of 100 participants taking Udemy courses, the results in this White Paper provide useful insights to the online learning behaviour of Singapore learners. Implications of these results on development of online course initiatives and implementation by training organisations and regulators are also discussed.

Overview

Beginning with the demographical profile of the 100 participants, the White Paper provides data based on the employment groups (e.g. full-time employed, self-employed and freelancers) to examine their reasons for engaging in online learning and their specific learning behaviours. Besides discussing how and when they engage in online learning, data on classroom training is also used to provide reference for comparison. Based on the results found, there are useful insights for training organisations and regulators to consider and act on. The White Paper concludes with a section on possible areas for improvement in online learning to address the learner's needs.

Conduct of Survey

The results in Part 2 of the White Paper are derived from data collected via an online survey conducted in mid-February 2016 with learners in Singapore who are currently learning online via Udemy. To encourage participation in the survey, the 100 participants were given a $10 credit to purchase Udemy courses. In addition, all participants were informed that their individual responses would be kept confidential.

The results of the survey are analysed and illustrated using column graphs to facilitate interpretation and discussion of the results. Since the number of participants is exactly 100, the figures in the graphs also correspond to percentages to facilitate interpretation of the results.

Part 2: Online Learning Behaviour of Learners from Singapore

A) Demographics of Survey Participants

Age and Employment Status

The age of the participants ranged from 15 to 80 years old (see Figure 12 below). Most participants however were concentrated around the 35-45 age range, with a sample median age of 37.5 years. Compared to data from Part 1 of the White Paper, this survey comprised older participants with a higher percentage (63%) of participants in their 30s to 40s, compared to 40% as reported in Part 1 of the White Paper. Only 7% are in the 15 to 20 year range, which imply they may still be school-going or serving their National Service.

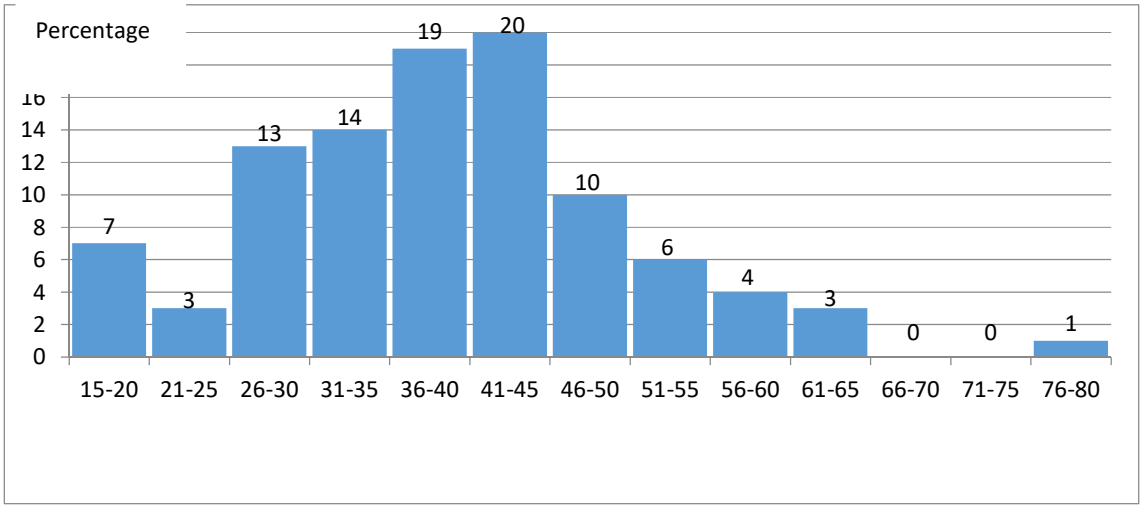


Figure 12: Age Distribution of Participants

The increase in median age correlates with the employment status of the participants as shown in Figure 13 below. 81% of the participants were either employed full-time, self-employed or engaged in contractual or freelancing work.

The data shown in Figure 13 reflect participants who are older and likely to have more work experience compared to the typical profile of Udemy learners globally.

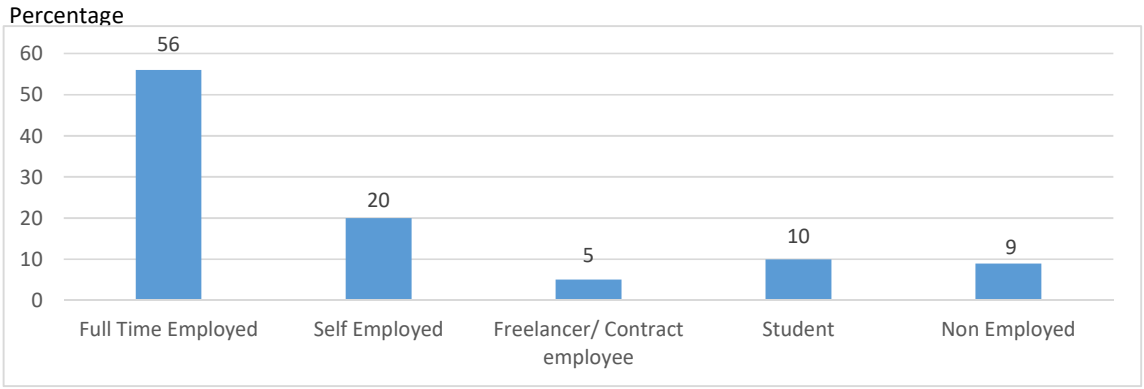


Figure 13: Employment Status of Participants with Majority in Full Time Employment

Highest Educational Qualification

The majority of participants possessed at least a university degree. 49% of them had bachelor's degrees and 24% had post-bachelors degrees (e.g. Masters), in congruence with the general profile of Udemy learners and online learners in general.

Slightly more than a quarter of the participants have up to Junior College (JC), Polytechnic (Poly), Secondary school or other qualifications (see Figure 14).

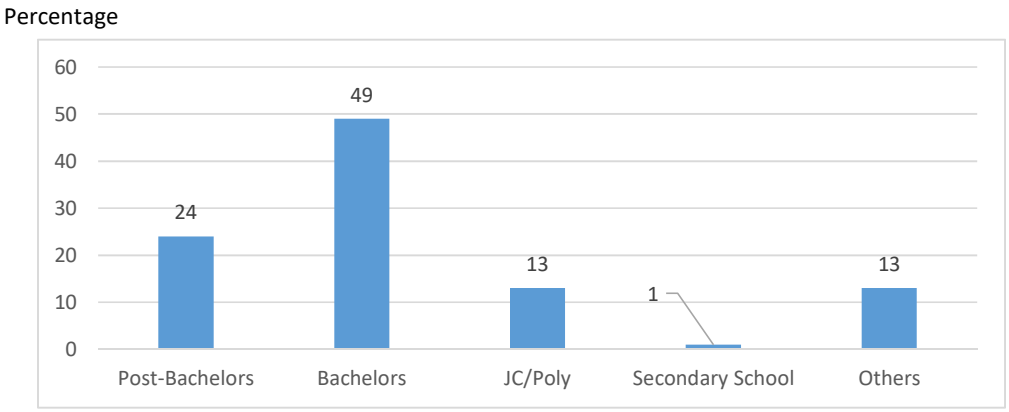


Figure 14: Educational Qualification of Participants with Majority Being Graduates

Gender

A large majority of participants were male (87%), compared to females (10%) with 3% of participants who did not specify their gender (see Figure 15). The ratio of male to female learners corresponds to past findings about the gender of learners on Udemy.

The demographical profile of the participants in this survey slants towards an older sample with more engaged in work. However, their educational qualifications and gender correspond with the typical Udemy and online learner profiles based on past studies.

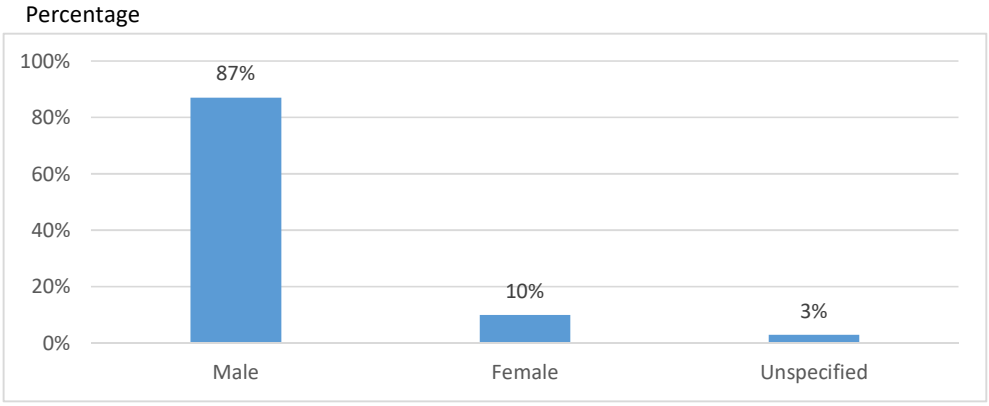


Figure 15: Gender Distribution of Participants with Majority Being Males

B) Online Learning Behaviour

One of the goals of this paper is to inform the development and implementation of online courses based on the learning preferences (e.g. Willingham et al., 2015; Dunn and Dunn, 1993) that Udemy learners possess. Learners were asked to select how they prefer to learn when undertaking Udemy courses. They could select as many options as they wanted. Their responses are shown in Figure 16. The level of learner engagement increases from left to right (i.e. from Listening to Completing Assignments) on the horizontal axis.

The data show that certain approaches to learning content were more preferred than others. Interestingly, viewing and listening to videos were not the most preferred approaches, in contrast to the typical nature of online courses with most content in video and audio formats. The most preferred approach was experimenting and applying concepts learned, possibly to real life work contexts. The least preferred mode for Udemy users appears to be discussing with others.

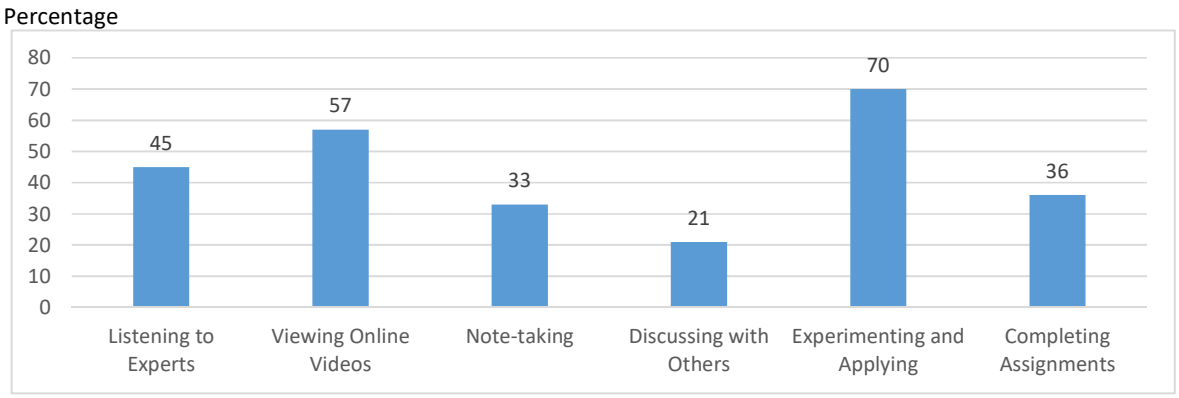


Figure 16. Learning Preferences among Participants

Furthermore, Udemy users when asked how they engaged in specific learning tasks to remember and assimilate online content, indicated a preference to pause for self-reflection, followed by watching the videos from start to end and selecting useful points for learning (see Figure 17).

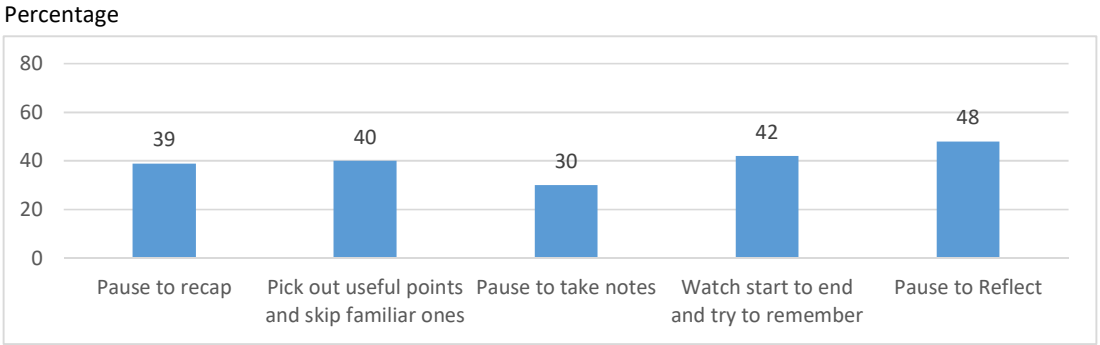


Figure 17. Online Learning Tasks

Based on general adult learning principles, most adult learners engage in learning for the purpose of applying to their work or personal lives. With the sample population being older and in employment, it is not illogical that these learners prefer to experiment and apply the concepts learned as part of their learning and assimilation process. The two graphs suggest that most Udemy learners prefer to reflect deeply on the concepts presented with the intention to experiment with and apply them, for effective learning. This hypothesis is discussed in a later section on learner's reasons for engaging in online learning.

The implications of this finding would impact online course development and marketing. Courses that focus on skills and practical expertise, according to the results, coupled with an application-based teaching approach would likely fit better with the learning preferences of Udemy users. Delivering online content should revolve around real life examples, common applications and personal connections besides addressing theories, terminologies and abstract concepts. It is expected that the application-oriented approach will contribute towards higher productivity of the workforce at the national level.

"…most Udemy learners prefer to think deeply on the concepts presented so as to experiment with and apply them…"

C) Engaging in Online Learning for Work Application

Reasons for Learning Online

This segment of the White Paper examines why learners in Singapore engage in online learning. The participants were allowed to select more than one option from among the various reasons such as upskilling their current work skills to learning skills for future work.

For the participants in full-time employment, using online courses to learn skills and knowledge pertaining to their interests *outside* their current field of work was a key reason to learn online (see Figure 18).

This reason is supported by the finding that the highest proportion of full-time employed learners engaged with learning online in the early evenings or in the late nights. It is also reasonable to expect that the full-time employed learners will find it difficult to justify to their employers if they engage in learning skills outside their fields of work during work hours. Hence, online learning in the evenings becomes a relatively inexpensive and self-directed avenue to acquire these skillsets. (see Figure 18).

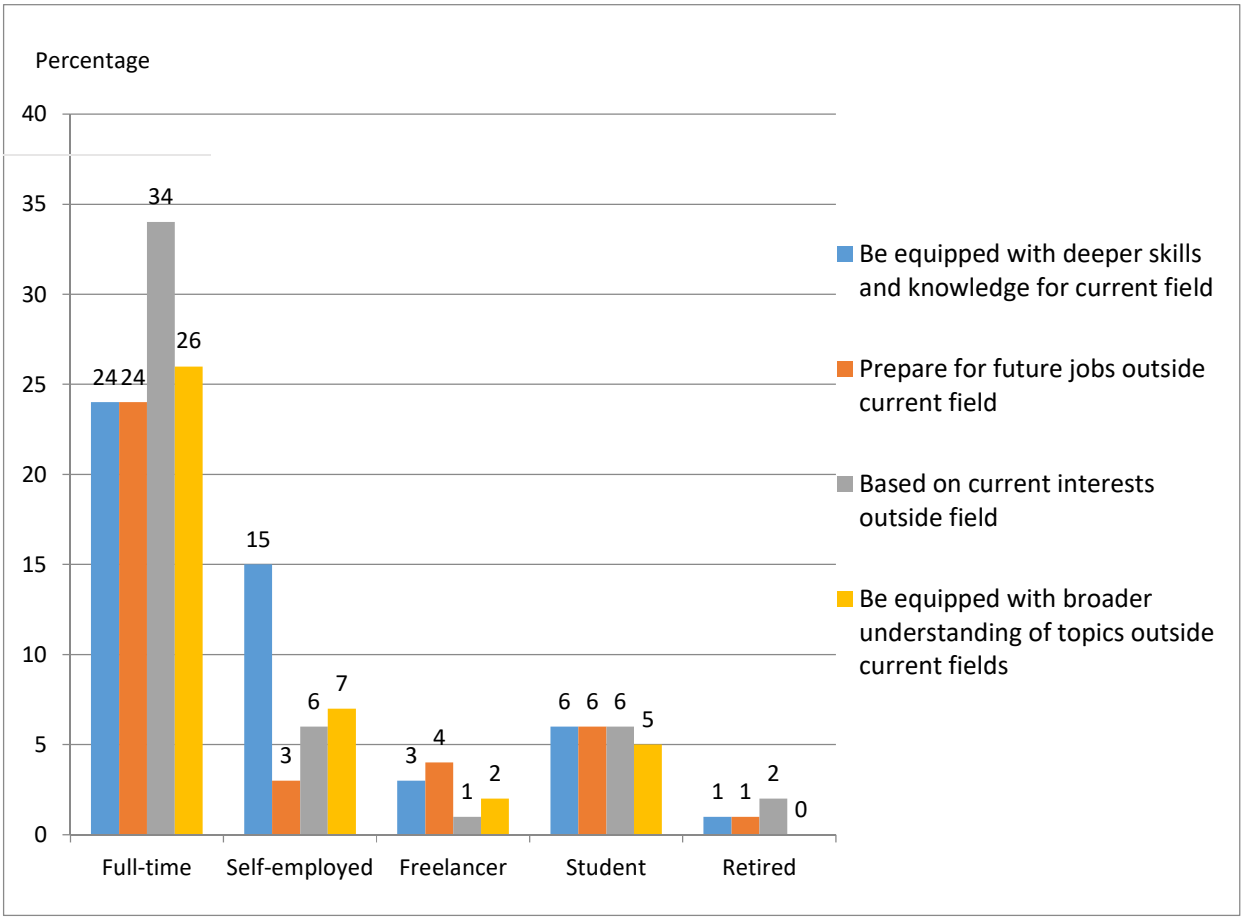


Figure 18. Reasons for Learning Online

Referring to Figure 19, the majority of the learners across all of the groups, except for the retirees, access online learning in the evenings and late nights (presumably close to midnight). It would appear that online learning is an activity that most learners engage in outside of their working hours, at their own time. In this regard, the proposition becomes interesting as lifelong learning becomes self-directed with one's own interests being the primary driving force for this endeavour.

The question is how such self-motivated learning can be further extended and facilitated to enhance one's skillsets for application to one's work either now or in the future. It is likely that funding some of the learning endeavour can be useful (as evident from the upsurge in usage of SkillsFuture Credit to pay for online courses). Alternatively, allowing learners to engage in online learning during work hours could also encourage self-directed learning.

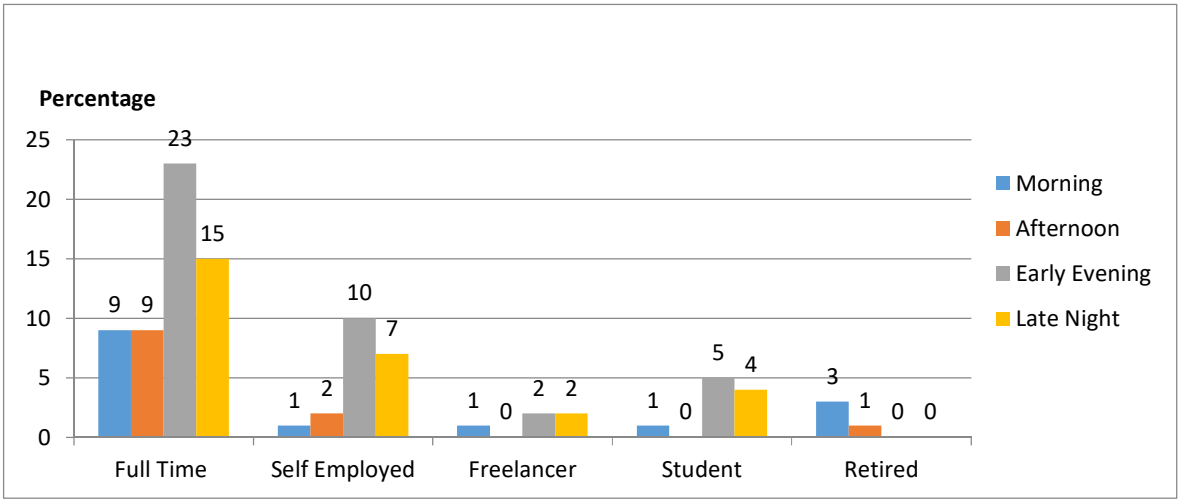


Figure 19. Time of Day to Access Online Courses

Comparing Online with Classroom Learning

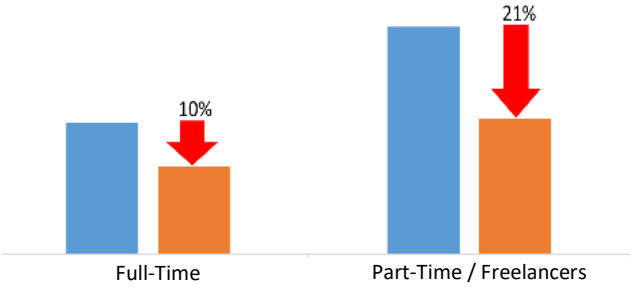
When we examine the results in terms of the duration for online learning across the various employment groups, the findings become even more interesting. About 30% of learners in full-time employment engage in online learning more than 14 days in a year (see Figure 20). This percentage increases dramatically to 52% for the self-employed and freelancer groups when combined. It would appear that online learning becomes a viable alternative to classroom training since these groups need to pay for their own training and classroom training tends to be much more expensive compared to online courses.

When we make a cross reference to the results shown in Figure 18, these self-employed learners are also using online course to acquire skills for their *current* fields of work which suggests that these self-employed learners engage in online learning to directly apply the learned skillsets to work.

As alluded to earlier, it is possible that self-employed workers may not have many avenues or the resources for job skills training, compared to their full-time employed counterparts who may be sent for classroom training courses by their organisations. In addition, there may be more opportunities for workplace learning for full-time employed learners with colleagues and superiors providing real-time on-the-job feedback whereas self-employed learners will have to seek advice from their own mentors or peers for professional development, which in reality, can be infrequent and difficult.

The duration of online learning compared to classroom training for the past year is quite unexpected (see Figures 20 & 21). We would expect that individuals would rely more on formal learning within a classroom setting for skills upgrading than the online environment. The results show otherwise.

Almost all groups, with the exception of the students, experienced a drop in duration of learning for classroom training when compared to online learning. Obviously, the sample population being Udemy users will lead to a selective bias for online learning but it is still startling to see the difference in duration between online and classroom training given that online courses is a relatively recent phenomenon.



For instance, the percentage of learners in full-time employment engaging in more than 14 days of online learning decreases from 30% to 20% for classroom learning. The decrease in classroom training for the self-employed and freelancing groups is even sharper, at 21%. From 52% of these learners with more than 14 days of online learning, the percentage falls to only 31% with more than 14 days of classroom training.

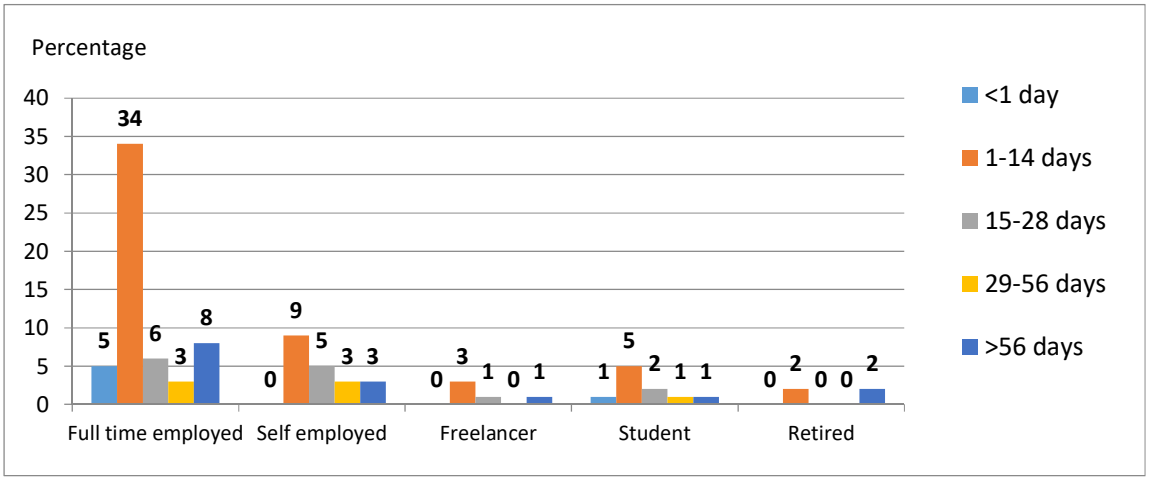


Figure 20. Time spent Engaged in Online Learning

These results imply that there is a group of Singapore learners utilising online learning for professional and personal development in areas associated with as well as outside their own fields of work.

This finding is important as it implies that, at least for the sample population, online courses play an equally important role in the professional development of the individual learner as classroom training, where the duration of engagement is concerned. As the usage of online courses increases, this trend will no doubt further escalate the role of online courses in enhancing work skills for the workforce, thereby, raising the importance of research aimed at improving the efficacy of online course design and development. When it comes to future-proofing the workforce, it may be useful to seriously consider online learning for skill acquisition from both a strategic and policy-making point of view for training organisations and regulators.

… the participants spent more time learning online than in classrooms for the whole year ….

…online courses may play a much greater role in professional development than previously thought

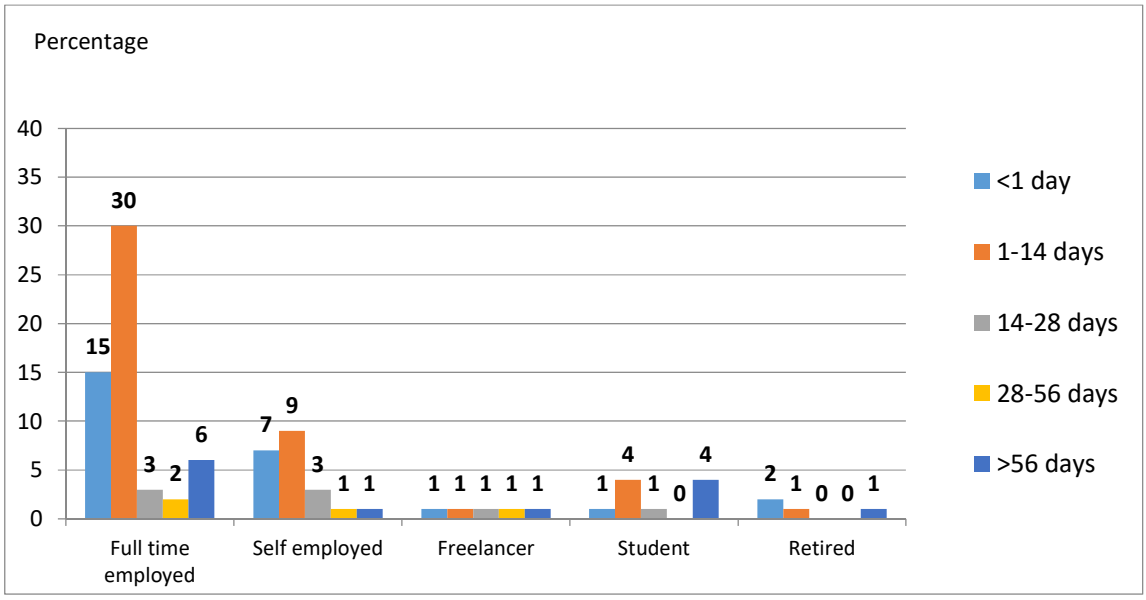


Figure 21. Time Spent on Classroom Training

Application to Work and Studies

One other important question for us to address is whether the learning that learners acquire through the online courses is applied to work (or school for the students). The earlier results on the learners' reasons for learning online may already allude to the fact that some learners (especially the self-employed) intend to use the learning from online courses to apply to their immediate work. As with all good intentions, it is unclear if the learners actually carried out their original purpose of intent when they undertook the learning. The following results show the extent of application to work or school by the various groups of learners.

The survey question asked the participants to rate the extent they applied the concepts learned through online courses.

Interestingly, despite indicating that they chose content outside their fields of work, the level of application for the full-time employed is higher than those for the self-employed and freelancer groups (see Figure 22). It is well-documented (e.g. Billet, 2002) that full-time employment does present opportunities for workers to acquire and apply skillsets in a manner that self-employed and freelancing workers may not have, including coaching and feedback from colleagues and superiors.

In contrast, the proportion of students who rated 'moderate' and 'high' to whether they were able to apply their learning to their studies is relatively higher at 70%. However, do note that the sample size for this group is small (n=10). Hence, more data on this group will be needed to understand their needs.

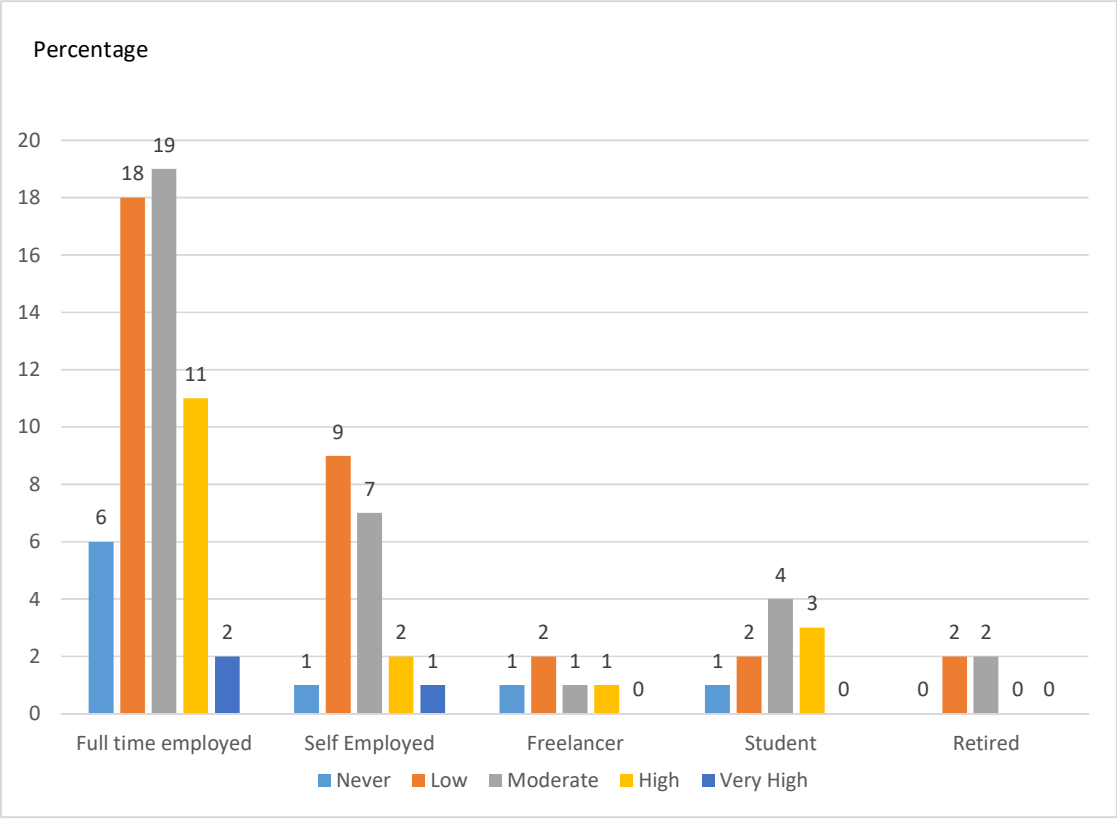


Figure 22. Applying Online Learning to Work

Given that the levels of application across all groups still have much room for improvement, there may be a need to examine how online courses can narrow the gap between understanding the theory to move into helping learners increase application to work. Work tasks generally take on a more practical approach (e.g. troubleshooting and finding solutions), which may make didactically-taught concepts difficult to transit into the application phase.

In conclusion, courses targeting skills development in the professional job sector must start to deliver their content in a more experiential and pragmatic way, as ultimately such is the objective of both the course instructor and the learner - to enable and facilitate the application of skills in the workforce.

"Delivering [practical] course content should revolve around real life examples, common applications and making personal connections with the content."

Part 3: Online Learning Communities in Singapore and Other Countries

From Users to Instructors

The literature (e.g. Wilcoxon, 2011; Shea et al., 2005) clearly shows that online communities develop when there is purpose and a sense of belonging with contributions by members of the communities. These members often evolve from newcomers to participants to collaborators and finally, contributors.

> *"One thing is certain, learning communities are more engaging and members more engaged than is the case with traditional instruction."*
>
> Wilcoxon (2011)

Understandably, these studies are focused on the development of communities centred round a specific discipline or course of study (e.g. nursing, computer studies) and the members' involvement may be measured in relation to a specific online course.

Likewise, it is not uncommon to find many Udemy learners begin their learning journey as curious newcomers browsing through the product pages of online courses in specific disciplines or subjects, to experience for themselves what online learning is about. Many eventually become learners by enrolling in the free or paid courses. What is also interesting and important is that a proportion of these learners decide to contribute to the community as instructors, by creating courses for other learners to consume.

In addition, there are also users who begin their journey with Udemy with the intention to create courses as a means to generate revenue and then purchase courses created by other instructors as they find the courses interesting or useful. Based on the data to be presented later in this section, we have generated a working model for our discussion. The model uses the learning journey of Udemy users as reference. See Fig. 23 below. Essentially, learners start from browsing and then, they can move into any of the 3 activities:

- Enrolling in free courses
- Enrolling in paid courses
- Creating courses

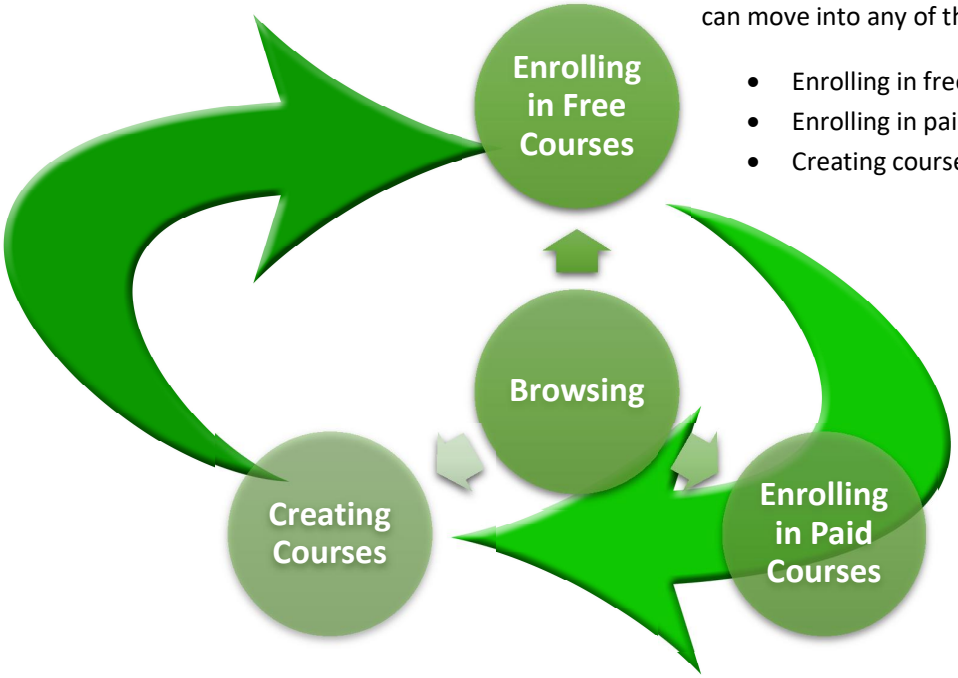


Figure 23. Model showing the Communities of Udemy Learners Participating in Different Activities

As the model suggests, users may start out by browsing online courses and if they like what they see, they move on to enrolling in free courses, paid courses or in some cases, develop their own courses to share with the community. While the development of the online community may not follow a linear pathway from browsers to instructors, it would be useful to examine how the users are participating in the online community, whether as browsers, learners and/or instructors, and if it is possible to facilitate the development of the various clusters of users, to bring about a healthy online learning ecosystem.

We have extrapolated this journey to larger online communities at the national level. By examining how these online learning communities mature, we may be able to identify the category that these communities are concentrated in and deepen our understanding on how to grow the learning communities. Then, it may be possible to understand the factors involved in moving entire national communities onto online learning faster and more effectively.

In the context that governments need to upskill massive numbers of workers in a scalable and sustainable manner to prepare for the age of large scale automation and intelligent machines, this understanding of how we can get more people to learn online becomes highly critical for national survival.

With Udemy headquartered in the United States (US), the work to grow the user base naturally started in the US. With a head start of 2 to 3 years over other countries, the American user base is much larger than those in other countries. Communities in many countries such as Singapore grew organically, with little direct marketing until the recent 1 to 2 years.

To be clear, the number of Udemy users in each country is not proportional to the population size. There are many possible factors that impact the size of userbase, including disposable income and English literacy rates. Some of these reasons will be discussed later in this section.

The ranking of the online communities across the various countries shown below are based on cumulative data since the founding of Udemy in 2009.

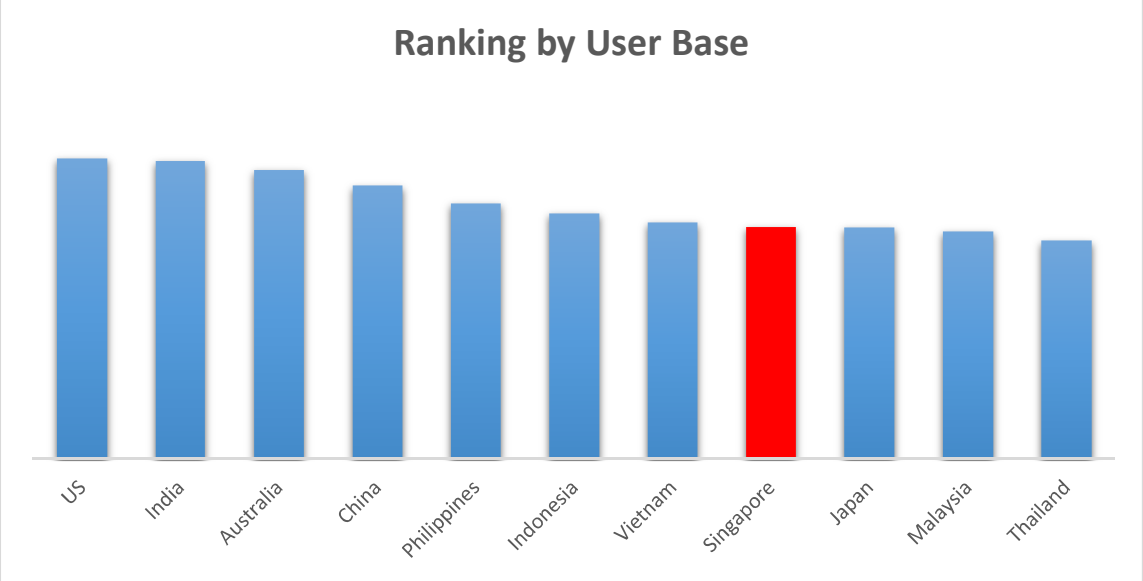


Fig. 24. Ranking of Countries according by Udemy Userbase

Note: The bar chart above is not drawn to scale.

A) Curiosity

– The Browsers

With the global interest over online learning and professional development often fuelling curiosity among the more informed, Udemy presents an interesting product for them to try. These users usually browse through the course catalogue or they may review the course content without enrolling into a course. Some authors call them 'lurkers', simply because they access the site, possibly to read the content but do not participate in any meaningful exchange. There could be several reasons for them not engaging in learning or enrolling in the courses, including the lack of language compatibility and infrastructure (e.g. Wi-Fi) to support online learning.

To arrive at the number of browsing only activities per user, we used the number of users as a proxy* for overall user activity which includes course enrolments and course creation activities. Arguably, the difference between the overall user activity, and enrolment or course creation activities is attributed to users who only browse through the courses. This difference is converted into an index to show the number of browsing only incidences (total browsing activity minus enrolment and course creation incidences) per user on average.

For the communities with a high browsing only index, it implies that they entered the site but did not continue learning or creating on the Udemy space. These communities did not enrol into the free or paid courses nor create any courses. On the other hand, communities with low browsing only index indicates that many of the users in the country progressed further along and were willing to consider online courses as something potentially useful or interesting.

Countries such as the US and Australia with a large population of English speakers belong to the low browsing index category where users don't just browse, they also enrol into or create new courses. Some communities (e.g. in China and Vietnam) which are less English literate display higher browsing only rates. Besides language, the affordability of courses may also play a role in determining if users engage in online learning although if they are keen, they can still enrol in the free courses. The Udemy users in Singapore seem to have a relatively high conversion rate from browsing to free courses as shown in the next graph.

*Note that in the absence of actual data, the number of users was taken as the proxy for browsing incidences.

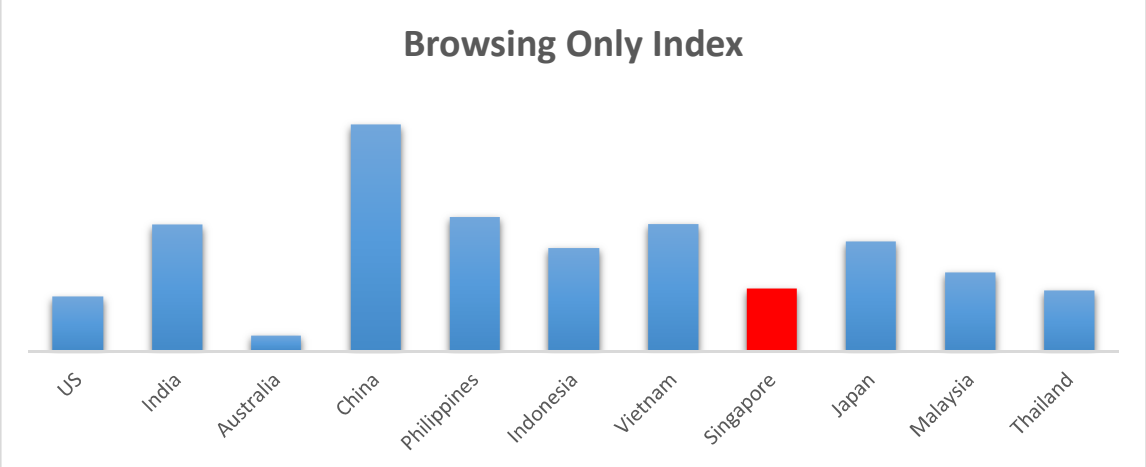


Fig. 25. Browsing Only Index By Country

Note: The bar chart above is not drawn to scale.

B) Consideration

– The Non Fee-Paying Learners

Given that there are some good quality free courses available, it is not uncommon to find some learners new to online learning to start with sampling the free courses, just to get a sense of what online learning on Udemy is like.

The free enrolment index for Singapore is somewhat higher than the other English-speaking countries like Australia and the US. This is unsurprising as the number of users jumped from 65,000 at the end of 2015 to 99,512 in August 2016 and so, many of the users from Singapore are still new to Udemy and online learning.

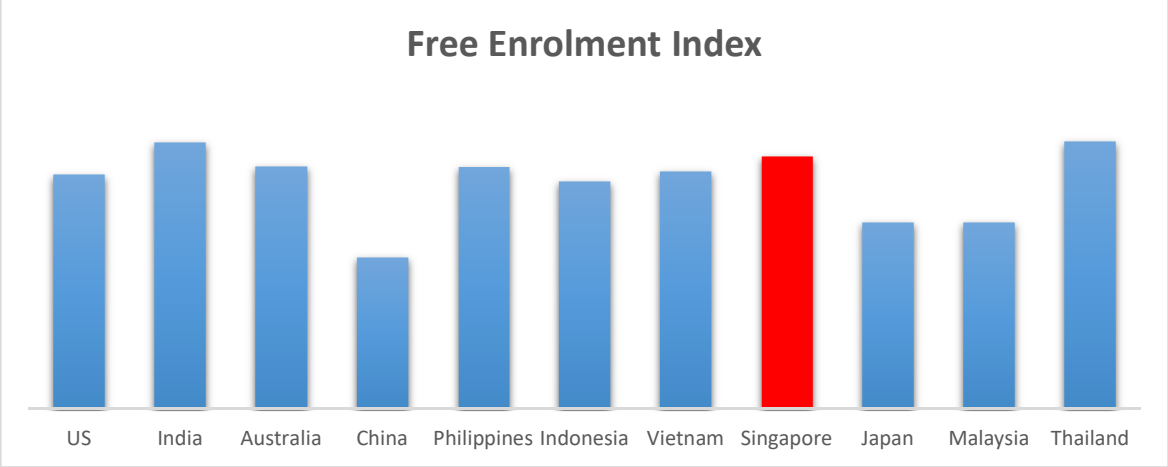


Fig. 26. Relative Positions of Free Enrolment Index By Country

Note: The bar chart above is not drawn to scale.

The ratio of free enrolments relative to the user base (or number of free enrolments per user) is a useful proxy indicator of the interest new users have towards Udemy courses. Over time, the learners who like the learning experience from the free courses may purchase courses to enrol in. Hence, with repeat learners, the percentage of paid enrolments would gradually increase over time, as the online learning community gets more mature. Based on the model (see Fig. 23), there are also learners who may have enrolled in paid courses first and after realising that there are good free courses available, participate in the free courses.

… the number of users jumped from 65,000 at the end of 2015 to 99,512 in August 2016 ….

This represents an increase of approximately 54% over a short span of 9 months. The increase is likely due to increased brand awareness due to marketing of Udemy courses which have been approved for purchase using SkillsFuture Credit in January 2016. There were also marketing campaigns and price changes which impacted the number of learners coming onto the Udemy platform. Essentially, Singaporeans above the age of 25 years old were given 500 dollars of credit to purchase courses, including the 1314 courses on Udemy.

There were at least 7 joint marketing and road shows with the Singapore Workforce Development Agency that Udemy embarked on to increase the awareness of Singaporeans to online courses during the first six months of 2016, which in turn likely boosted the number of new Udemy users in Singapore.

C) Commitment

– The Fee-Paying Learners

In the context that many of the learners in Singapore are new to Udemy and online learning, a key indicator of commitment is their willingness to pay for the courses. On this note, the paid enrolment index is similar to Japan, but below the US and Australia. The paid enrolment index for Malaysia is a surprise and it is unclear what the reasons are for the high paid enrolment index at this point in time. One possible reason may be that institutes for higher education in Malaysia may be putting their students through these paid courses as part of their programme requirements although further studies are needed to confirm this.

Over time, the number of paid enrolments for Singapore may likely increase as more Singapore users become familiar with online learning and its benefits. Based on quarter-on-quarter comparisons, revenue from Udemy courses in Singapore has increased consistently over the past 9 months.

… factors that impact whether learners are willing to pay ….include the relative spending power… and their English literacy rates

When interpreting these figures, there are other factors which impact whether learners are willing to pay for courses. These factors include the relative spending power of learners and their English literacy rates, especially for courses which require higher levels of English literacy. The exception to the rule would be the technical courses (e.g. computer programming) which tend to share similar technical languages worldwide.

There is also a small but noticeable group of learners who 'skip' this stage of paid enrolments to become instructors quite quickly. They may regard their transition into course creation to be naturally aligned with their current professional role as educators or subject matter experts. Their focus may be to generate revenue for themselves.

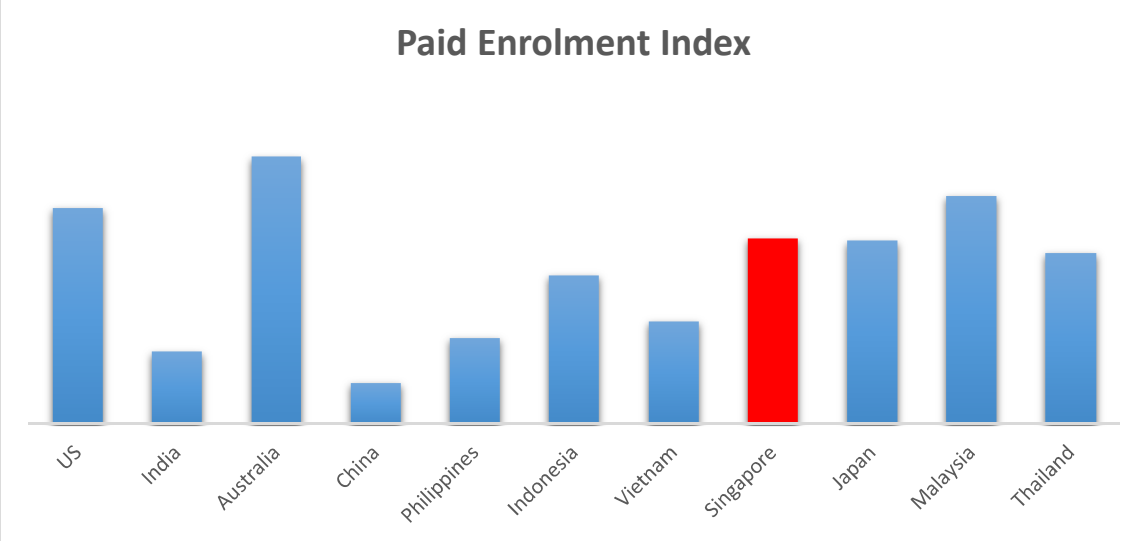


Fig. 27. Relative Positions of Paid Enrolment Index By Country

Note: The bar chart above is not drawn to scale.

D) Creation

– The Instructors

When it comes to course creation, Singapore may be considered a laggard for this indicator relative to other developed countries such as Australia and the US which embarked on Udemy courses 2 to 3 years earlier than Singapore. More surprisingly, however, are the high course creation rates by the Philippines and Japan. In Japan, there was a concerted push by the Udemy team to identify and develop the instructor pool coupled with efforts by one of the largest Japanese publishers to create online courses in Japanese for the past 1 to 2 years. As a result, the number of Japanese courses mushroomed despite the relatively low user base. The high course creation index for the Philippines is interesting and requires further research. It is unclear what the reasons are although it is possible that there is an active Filipino instructor community and/or schools in the Philippines creating courses for their students as part of the school curriculum. We do not know the reasons at this point in time.

It is critical that the CET community makes a concerted effort to drive online course creation as instructors are also often learners and this constant engagement in the online learning and teaching process facilitates the organic development of the learning community, both online as well as in-person. While there are already regular classroom-based workshops for new Udemy users and the larger Udemy community at the Innovation Lab, Lifelong Learning Institute, Singapore, focusing on e-designs and course creation, the Udemy team in Singapore is making course creation even simpler by allowing for bundling of online courses with face-to-face coaching. Hence, coaches can now blend their delivery with an online course, thereby shortening the face-to-face coaching duration and at the same time, enhance the experience for the learners with rich media content.

Generally, course creators have a vested interest to see more online learners taking courses (preferably theirs) so they become natural marketers of these courses. Hence, the ongoing cycle to drive learning and teaching is completed when users become instructors who subsequently purchase other online courses to keep themselves abreast of the developments in their respective fields.

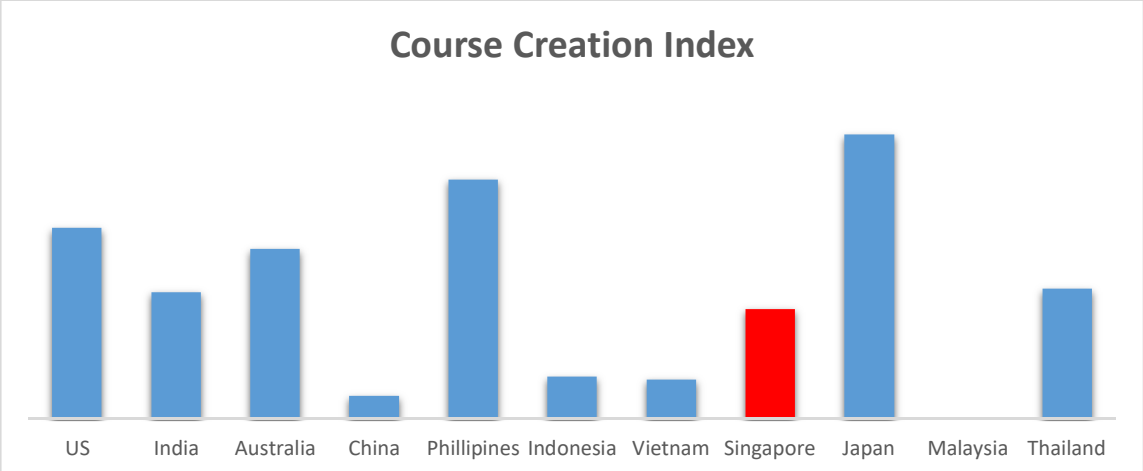


Fig. 28. Relative Positions of Course Creation Index By Country

Note: The bar chart above is not drawn to scale.

The Community Activity Profile

Having examined each category in detail, we can now put the data together to identify the categories of activity that each community engages in relative to the others.

To determine the Community Activity Profile (CAP) for each national community on Udemy, each community was ranked relative to others for each of the 4 categories (Curiosity, Consideration, Commitment and Creation). The higher the index, the higher its rank on the activity map. For example, the Udemy community in Singapore was ranked 4th, 9th, 8th and 5th across the 4 categories respectively.

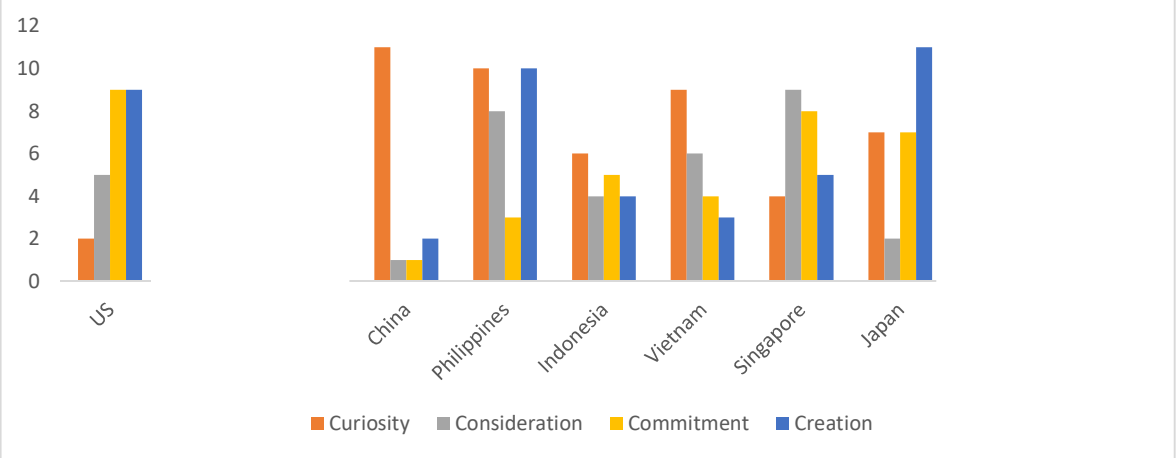


Fig. 29. Categories of Online Activities By Country

If we were to draw a line across the top of each bar, we would see an inverted U curve (see Fig. 30) which indicates that the Singapore community is very much in the Consideration and Commitment categories where learners enrol in free or paid courses.

China, the US and Japan are interesting examples as the shape of their curves differs from Singapore. In China, a large number of users remain in the Curiosity category and do not go on to enrol into courses or create courses. Again, we are unclear what the reasons are. Language compatibility could be one issue.

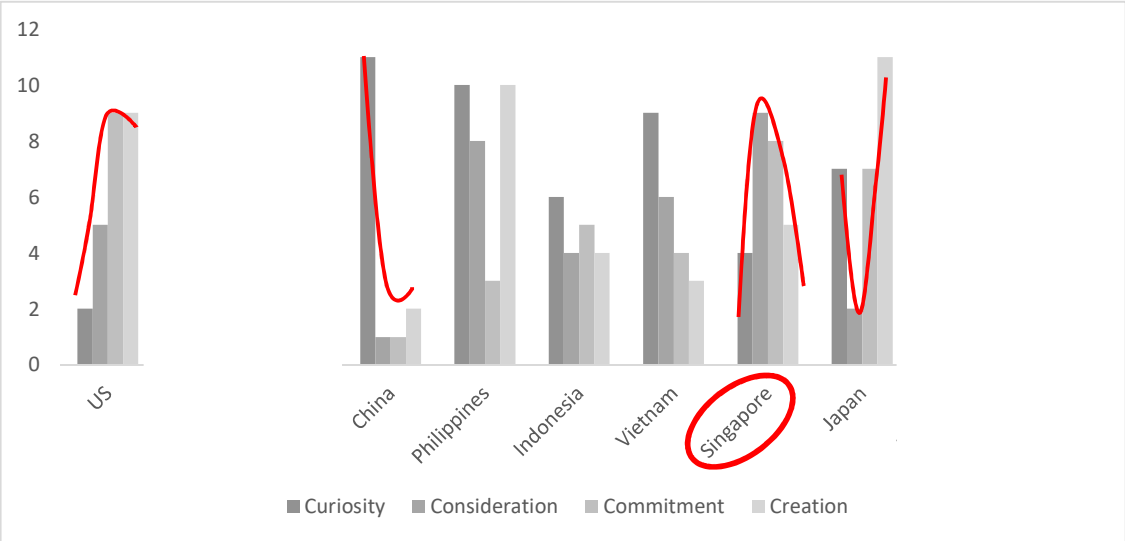


Fig. 30. Community Activity Profile By Country

On the other hand, the US community is quite heavily weighted in the Commitment and Creation categories. A large number of users in the US pay to enrol in courses and/or to create courses to share with or sell to other Udemy users, making the curve slanted towards the right. Finally, a large number of courses created are currently being created in Japan to cater to the growing Udemy community. As such, the curve is bimodal with more browsers and course creators predominating, relative to the other communities.

The **Community Activity Profile (CAP)** is interesting in that it indicates the types of activities that each community may be ready for and wants to engage in. These interests (e.g. to generate revenue) and constraints (e.g. language incompatibility or amount of disposable income) can be varied. We may have a better picture if we group the communities according to the shape of the curves.

The CAP for each community illustrates certain activities (e.g. learning or course creation) which may be of greater interest to its members. There are several possible uses of CAP but we will highlight two here:

1. Market analysis – the business development and marketing departments of training organisations may be able to utilise the CAP of each community in order to design effective marketing strategies to improve the sales of their online or blended courses
2. Community Development and Growth - the education ministries and training departments in the government will have a better inclination to move the online community in their own country into a more active role through targeted interventions (e.g. encouraging more course creations).

In studying the CAP for each community, there are patterns as to the types of CAP which indicate a more vibrant and active community. This leads us to the next discussion on how to grow a sustainable online community.

	Downwards Slash	U or V Shape	Inverted U Shape	Upwards Slash
Shape of CAP Curve				
Category	Curiosity	Curiosity & Creation	Consideration and/or Commitment	Commitment and Creation
Description of Users	Predominantly Browsers	Both Browsers and Creators	Predominantly Learners	Both Fee-Paying Learners and Creators
Communities	China Vietnam Indonesia	Japan Philippines Chart Area	Singapore Australia Malaysia Thailand India	United States

Table 2. National Communities Grouped based on Predominant Activities

Sustainable Online Communities

By putting the communities into the various CAP categories, we can see more clearly what the predominant activities are and what other online activities should be encouraged to spur further development of the community.

Generally, a more active community points to one with the potential to grow and engage in further learning and based on observations of Udemy users globally, there is an upward trend when the proportion of learners and course creators is higher. By definition, browsers do not log in so these communities are less engaged, resulting in lower activity rate.

Obviously, if certain communities actively enrol in fee-paying courses, marketing departments may have more inclination to spend the marketing dollar in those communities. Conversely, governments may be interested to drive up participation if the community is less engaged in the activity (e.g. course creation). The overall assumption is that the community will benefit from a balanced proportion of activities across the 4 activities, especially for learning and course creation.

Returning to the context mentioned in the introduction of this section, online learning participation is expected to increase over time as more technology-savvy millennials enter the workforce and as older workers require upskilling as skills become obsolete faster. It will be in the interest of individuals, enterprises and governments to consider online learning as one avenue for skills upgrading especially with online learning providing up-to-date, affordable instruction from global experts. One of the reasons for the currency of content in online courses is that they can be generated and updated much faster compared to courseware for classroom training.

… a more active community points to one with the potential to grow and engage in further learning …

Summary

In summary, Part 3 of the White Paper dealt with the types of online activities that communities all over the world are currently engaged in, specifically on the Udemy platform. The Singapore Udemy community can be considered a new entrant to online learning compared to the communities in the United States and Australia, with the upsurge in number of users occurring in the last 1 to 2 years. Part of the reason could be the result of the small geographical size of Singapore which implies that Singapore adult learners can travel to any part of the country for classroom training relatively quickly. It also means many Singapore learners are unaware of world class quality online courses by global experts. More importantly, these courses include content which can be very current and 'cutting-edge'.

In short, to remain innovative and competitive, the Singapore workforce need be open to accessing online content in order to remain nimble to adapt to changes and new developments. To develop the online community, new courses produced by local instructors may facilitate the 'buzz' to stimulate more ground interest in online learning. This is commonly seen in more 'mature' communities such as the US and Australia where a healthy ratio of instructors to users is observed.

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