MOOCs for Development? A Study of Indian Learners and their Experiences in Massive Open Online Courses

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MOOCs for Development? A Study of Indian Learners and their Experiences in Massive Open Online Courses

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Abstract

The study outlined in this thesis provides an account of the demographics, motivations and experiences of Indian learners in Massive Open Online Courses (MOOCs) comparing the UK-based platform FutureLearn and the Indian platform NPTEL (The National Programme on Technology Enhanced Learning).

A sequential mixed-methods approach was adopted. A web-based survey (n=2373) was used to collect demographical data and evidence of respondents' perceptions about their motivations for taking a MOOC, their learning experiences, and any challenges they may have faced while taking a MOOC. The survey phase was followed by 30 semi-structured interviews with learners from both platforms, adding a rich level of qualitative data to the study, revealing the varied experiences and backgrounds of MOOC learners from India.

Analysis of the collected data suggests that learners from India tend to be male, younger, more likely to be in formal education, and more educated than participants featured in many existing studies on MOOC learner demographics. Further, the current study outlined several demographic and motivational differences between learners on FutureLearn and NPTEL, likely to be attributable to the distinct objectives of the two platforms.

A more in-depth exploration of learners' experiences suggested that a diverse group of people, particularly on the FutureLearn platform, are using MOOCs to learn more about areas of personal interest, and, in some cases, using FutureLearn resources to assist in their teaching practice. Conversely, learners on the NPTEL platform, who tended to experience more technical challenges such as connectivity issues, were using MOOCs as a supplement to their formal studies, to make up for some of the systemic lack of quality education in many Indian universities.

This thesis suggests that educational technology, in the form of MOOCs, might not necessarily be widening participation in education in a Global South context like India. However, it offers a unique insight into the experiences of learners from India, and provides practical recommendations on how best to serve the needs of the varied Indian learners that make use of MOOCs.

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Next, I would like to thank the two platforms of FutureLearn and NPTEL, for taking an interest in my research, and giving me access to learners on your platforms. I believe this comparison between the two platforms will provide useful, practical feedback on how Indian learners are making use of your courses, and how you could better serve the needs of these learners. I would also like to thank all the participants that took part in this study. This study would not be possible without the time and thought you put into sharing your experiences.

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Chapter 1: Introduction

This chapter introduces the research study presented in this thesis. **Section 1.1** outlines the research problem and the rationale for this study. **Section 1.2** outlines the Research Questions of the study. **Section 1.3** describes the research approach taken in the study. **Section 1.4** includes definitions of key terminology used in this thesis. **Section 1.5** provides a brief introduction to the researcher and his background. Lastly, **Section 1.6** outlines the structure and organisation of the thesis.

1.1 Research Problem

Massive Open Online Courses (MOOCs) have seen tremendous growth since their mainstream popularisation in 2012, with thousands of universities across the world offering courses for free. The promise of a free, high-quality educational experience from some of the leading universities of the world has attracted millions of learners from all corners of the globe (Schmid, Manturuk, Simpkins, Goldwasser, & Whitfield, 2015, p. 117). However, as research on Massive Open Online Courses begins to mature, evidence suggests they are potentially deepening rather than widening access to education, and may not necessarily be benefiting the population of learners who lack access to higher education (Schmid et al., 2015; Zhenghao et al., 2015).

While the media coverage of MOOCs has sobered in the West (Kovanovic, Joksimovic, Gaševic, Siemens, & Hatala, 2015), MOOCs are still being positioned as potential solutions to the higher education challenges of the Global South (Laurillard & Kennedy, 2017). This thesis' focus is the Indian context, which has one of the largest Higher Education systems in the world, but faces the endemic challenges of lack of infrastructure, limited teachers, and an ever-increasing demand from a growing young population (British Council, 2014b). Indian learners comprise one of the largest subpopulations of learners in Western MOOC platforms (Kamat, Keleher, Patil, & Pujar, 2013; Nair, 2013), and through Indian public initiatives such as NPTEL (National Programme on Technology Enhanced Learning) and SWAYAM (Study Webs of Active–Learning for Young Aspiring Minds), learners across India have been participating in and benefiting from MOOCs. However, despite a growing understanding of MOOC learner populations around the world, there has yet to be a significant study on Indian MOOC learners - who they are, what motivates them to take a

MOOC, what are their unique experiences with MOOCs, and what challenges do these learners face.

The need for research into Indian MOOC learners became all the more valuable as this study progressed, as, in 2016, the Indian government announced a framework (University Grants Commission, 2016) for formal credentialing through MOOCs on SWAYAM and NPTEL, that allows learners from universities across India to complete 20% of their total credit towards any degree through MOOCs. These frameworks were put in place to potentially help learners at smaller institutions gain access to high-quality learning resources, yet, there was a paucity of research into the benefits these learners gain through completing these courses, and what potential issues may arise through the widespread use of such a system. While the Silicon Valley motto of 'Move fast and break things' (Taplin, 2017) seems to have inspired this rapid push to incorporate MOOCs within Indian education, studies such as the one outlined in this thesis provide a more circumspect, yet optimistic look at some of the realities of the experiences of these learners. This study enables the various stakeholders in Indian higher education to learn about the benefits, or lack thereof, of these MOOCs, that learners themselves perceive as being of importance.

Moreover, research into MOOC learner experiences tend to focus on singular case-studies (Zhu, Sari, & Lee, 2017), or a meta-level analysis of learners on a single platform (Christensen et al., 2013; Ho et al., 2015). This study, being a comparison of learners from two different platforms, can provide a unique insight into the impact of various aspects of a platform on the types of learners that are attracted to these platforms (in respect of various demographic factors), learners' motivations for choosing to study on one platform rather than another, and the differences, or similarities, in learners' MOOC study experiences.

Lastly, only 18.5% of empirical studies on MOOCs adopt a qualitative method (Zhu et al., 2017), and the lack of research into the diverse nature of learner experiences in MOOCs has also been a noted problem with MOOC research (Veletsianos, Collier, & Schneider, 2015; Veletsianos & Shepherdson, 2015). Using a sequential mixed-methods approach, through the use of web-surveys and semi-structured interviews, and the broader platform-

level comparison of learners from a developing world context, this study aimed to enrich the MOOC literature with the perspective of Indian learners, while also using a sequential mixed-methods research design, that benefits from both qualitative and quantitative inquiry.

1.2 Research Questions

The comparison between the two MOOC platforms guides the main Research Question of the study, split into three sub-questions related to the three main themes that this study explored; learner demographics, learner motivation and learner experiences. Further, each research question also includes a comparison with existing literature on these three themes.

RQ1(a): What, if any, are the differences in demographics of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these demographics differ, if at all, from MOOC learners more generally, as identified in existing studies?

RQ1(b): What, if any, are the differences in the motivations of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these motivations differ from MOOC learners more generally, as identified in existing studies?

RQ1(c): What, if any, are the differences in the experiences of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these experiences different from MOOC learners more generally, as identified in existing studies?

1.3 Research Approach

The research study conducted for this thesis used a sequential mixed-methods approach, as outlined by Creswell (2007), using both quantitative and qualitative research methods and analysis. The study was conducted in three phases. In the first phase of this study, pilot interviews were conducted with Indian MOOC learners (n=4), to get a sense of any 'India-specific' factors that may need unpacking in the next stages of the study. The findings of the pilot interviews influenced the second phase of this study, the design and deployment of a survey instrument (n=2373), which asked Indian learners from FutureLearn and NPTEL about their demographics and their patterns of engagement with MOOCs, as well as their perceptions on how important certain factors were to their motivations to take the MOOC, their experiences learning on the MOOC, and how often had they encountered particular challenges while taking a MOOC. The final phase of the study involved semi-structured interviews with participants from the survey (n=30), which generated rich and varied profiles of the different sorts of Indian learners that take MOOCs, their reasons for taking MOOCs and their experiences learning with MOOCs.

The data were then mixed, using descriptive and non-parametric analyses for the survey data, and a thematic analysis approach as posited by Braun and Clarke (2006). The rationale for choosing a Mixed Methods approach and an outline of the various stages of this study are discussed in **Chapter 4.**

1.4 Key Terminology

This thesis uses specific terminology that needs clarification, and this section provides definitions of how these terms were used within the context of this study:

Development: For this study, the term Development is used explicitly in the context of education, and relates to the United Nation's Sustainable Development Goal (SDG) 4 on Quality Education, to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO, 2016).

Global MOOC Platform: For this study, a Global MOOC platform refers specifically to English-language MOOC platforms that originate from North America or Europe, such as, Coursera, edX, and FutureLearn.

Global South - The term Global South refers, broadly, to countries outside Europe and North America, and unlike terms such as developing countries or third world countries, 'marks a shift from a focus on development or cultural difference toward an emphasis on geopolitical power relations.' (Dados & Connell, 2012, p. 12)

Learner Experience – This study defines the learner experience as the subjective perceptions of learners about their attitudes, behaviours, concerns and evaluation of their process of learning. **Section 3.3** discusses the literature on Learner Experience in MOOCs in greater detail.

Learner Motivation - This study uses the term motivation noting the dynamic nature of learner motivations in MOOCs. First, motivation refers to the factors that influence learners to take on a MOOC (their motivations to enrol), and second, motivation also refers to the factors that help learners persist with MOOCs (state-level motivation) (de Barba, Kennedy, & Ainley, 2016, p. 219). Where applicable, this distinction is made clear throughout the text, and motivation and the literature surrounding it is discussed in **Section 3.2**

MOOC: This study uses the term 'MOOC' to refer specifically to 'Coursera-type' MOOCs, also known as xMOOCs (Smith & Eng, 2013), which are typified by a centralised platform, mostly video-based content, and some form of automated assessment. The evolution of MOOCs, as well as a discussion of the different types of MOOCs, is outlined in **Section 2.1**

1.5 Researcher Background

As someone who was born and brought up in India, I have the first-hand experience of the Indian Higher Education system. After working in an educational technology company based in Mumbai in 2012, I saw the potential that technology could have in enabling high-quality learning in India. This coincided with the rise and hype around MOOCs, and I pursued a Master's from the University of Manchester in 2012-13, completing my dissertation with an ethnographic study of learner experiences in a single MOOC. After returning to India, I observed a group of young learners in Mumbai who were passionate about learning and had self-organised a community around MOOCs and online learning. These young learners would watch MOOC videos together, discuss the video they had just watched and would follow it up by collectively solving the weekly assessment activities.

While my Master's study provided me with a more nuanced understanding of the potential of MOOCs, this experience with the young learners in Mumbai made me curious about the different ways in which MOOCs were being used across India, and led me to enrol for a PhD at The Open University. While I am generally sceptical towards sweeping claims about the transformative potential of MOOCs, especially in India, I believe there is immense value in understanding how learners are currently making use of and benefitting from MOOCs. This can help in our holistic understanding of the impact of MOOCs in India, and can be of practical use to developers and policymakers alike, who could design courses or policy that may be better suited to meet the promise of MOOCs as a vehicle for development.

1.6 Organisation of this thesis

The remainder of this thesis is divided into six more chapters:

Chapter Two provides the reader with a contextual overview of this study. It discusses the developments leading to MOOCs, some of the key concerns around MOOCs relevant to this study, and the different ways in which MOOCs are currently being utilised, in formal learning, as well as in the Global South. Next, this chapter introduces the Indian context, with a brief overview of Indian Higher Education, and the various MOOC initiatives organised in India. The chapter ends with an overview of the two platforms that this study is focused on comparing, NPTEL and FutureLearn

Chapter Three provides a review of the literature on the three themes that this study explores. Firstly, it considers the literature on MOOC Demographics, our present understanding of the Gender, Age, Education Level and Employment Status of MOOC learners. It also discusses the role of Culture, Nationality and Language in MOOCs. Next, it outlines the literature on Learner Motivation, our understanding of why learners choose to take MOOCs, as well as some of how learners motivate themselves to persist with the MOOC. Lastly, this chapter discusses the Learner Experience in MOOCs, including the various classifications of learners, the role of social learning in MOOCs, and some of the challenges faced by MOOC learners.

Chapter Four outlines the Methodological basis for this study, and the rationale for the pragmatic perspective that is chosen for this study. It outlines the sequential mixed-methods approach that this study used, as well as alternative methods that were considered to answer the research question. Next, the chapter discusses each of the three phases of this study, including research instrument design, participant recruitment, and the methods of analyses. Lastly, this chapter discusses the ethical concerns taken into consideration during this study.

Chapter Five provides an overview of the findings of this study. It highlights the findings from the Phase 2 survey, including a comparison of the demographics and patterns of engagement with MOOCs, as well a comparison of the Likert-type items on motivations and experiences, identifying through non-parametric testing, which of the Likert-type

items had a statistically significant difference, and which did not. Next, the chapter outlines the nine themes identified through the analysis of the qualitative interviews, providing brief excerpts that typify each of these themes. It ends with a diagrammatic representation of each of these themes and survey findings, and how they map to each of this study's research questions.

Chapter Six analyses the findings highlighted in Chapter Five. After mixing of the quantitative and qualitative findings, this chapter is split into the three main themes of this study, Learner Demographics, Motivations and Experiences, and also including a detailed answer to each of the three Research Questions.

Chapter Seven offers a discussion into the role of Indian and Western MOOCs as they currently exist, and their potential use in the future, based on an analysis of the data and the current literature.

Chapter Eight concludes the study, summarising the findings, discussing the contribution and limitations of this study, and providing practical recommendations to the various stakeholders interested in MOOCs in India. It ends with a discussion of potential future avenues for research that emerged from the findings of this study.

Chapter 2: Background

This chapter provides the reader with a contextual background to MOOCs, the Indian context, and the two platforms being compared in this study. **Section 2.1** covers the evolution of MOOCs and the numerous predecessors within the broader distance education and open education movements that led to MOOCs. **Section 2.2** outlines the current state of MOOCs and some of the more general themes emerging from MOOC research. **Section 2.3** discusses the various methods by which MOOCs have been incorporated within formal learning contexts. **Section 2.4** briefly outlines some of the major MOOC platforms and initiatives from the Global South, with specific mention of China. **Section 2.5** introduces the reader to the Indian context and outlines explicitly some of the key challenges facing Indian higher education. **Section 2.6** outlines the various MOOC initiatives in India. Lastly, **Section 2.7** will outline the two MOOC platforms that this study is comparing, FutureLearn and NPTEL.

2.1 The Evolution of MOOCs

Pinpointing the origins of Massive Open Online Courses (MOOCs) is often a contentious exercise and is dependent on the narrative one wishes to follow. If one were to believe the Silicon Valley narrative, as critiqued by Weller (2015), then MOOCs are a direct consequence of education being 'broken', needing revolutionary technological solutions that only the free-market economy could provide. However, such a view ignores decades of online and distance learning, and more importantly, contributions of the broader open education movement and connectivist MOOCs – all of which laid the foundations for what are now termed as MOOCs, and therefore one must acknowledge and situate our current understanding of MOOCs as part of this broader movement.

For this study, MOOCs are situated within the broader traditions of distance education and open education, and this section traces this evolution of MOOCs, from its precursors in the distance education and the open education movement to its connectivist origins and the hype-driven mainstreaming of MOOCs in 2012. This outlining of *how we got here* provides the reader with a contextual basis from which to understand how MOOCs came to prominence, and what some of its implications might be for countries in the Global South.

2.1.1 Distance Education

The origins of distance education can be traced to mid-19th Century Europe and the United States through the creation of correspondence courses, which prospered as technological improvements significantly increased the efficiency of the postal service (Moore & Kearsley, 2011, p. 24). From its origins, the premise of distance education was to provide learning for those otherwise at a disadvantage or exclusion from the formal educational system. The early beneficiaries of this new form of learning, among others, were women, who at the time were unable to partake in formal education. Correspondence courses also found success with vocational training. The International Correspondence Schools, set up to train railroad workers and miners in the US, had enrolled over 2.5 million students by 1923 (Casey, 2008). Hence, the idea of a 'Massive' cohort of learners is not necessarily a new phenomenon.

Broadcast technologies, namely, radio and television, provided the next technological leap in distance education. From the early 1920s, universities in the US were offered for-credit radio courses. Several "Schools of the air" were established in this period, including the Ohio School of the Air in 1929, the RCA Educational Hour in 1928, and the American School of the Air in 1930 (Moore & Kearsley, 2011, p. 29). The use of radio to broadcast educational content was deemed particularly useful to those in remote and rural parts of the world, such as the Australian Outback (Fitzpatrick, 1982). From the 1950s, television stations started broadcasting educational content, and by the 1970s, around 150 TV stations were broadcasting instructional TV programs from K-12 through to post-secondary education in the US (ibid. p. 30).

The third generation of distance learning, according to Moore and Kearsley (2011), came with the formalisation of distance learning through the foundation of The Open University, in the UK, along with several university-led distance learning programmes. However, it would be the model of the "mega-university" (Daniel, 1996) dedicated to distance learning, which would catch-on, leading to the creation of Open Universities around the world. In fact, in India alone, there are thirteen regional and one national Open Universities (CEMCA, 2016, p. 20). What separated open universities from earlier iterations of distance learning was the emphasis of constant learner support by academics, along with the open-

entry policy for prospective applicants. While the courses were considerably cheaper than their bricks-and-mortar counterparts, there was still a fee involved in taking these courses, and as technology evolved, particularly with the creation and widespread reach of the internet, there were increasing calls to use technology to increase access and remove barriers to learning, leading to the formation of the open education movement (Atkins, Brown, & Hammond, 2007).

2.1.2 OER and Open Education

With the rapid growth of the Open Source software industry in the late 1990s, academics too began noticing the potential of releasing content openly on the internet. Several frameworks such as David Wiley's 'OpenContent License' in 1998, and Larry Lessig's 'Creative Commons' in 2001 (Wiley & Gurrell, 2009), were set in place to allow users to upload and appropriately license their content openly on the web.

One of the early signs of a shift towards openness from mainstream academia came about in 2001, with the formation of the MIT Open Courseware (OCW) initiative (J. S. Brown & Adler, 2008). Funded by private foundations, materials from approximately 2000 courses at MIT were to be put online for free. This initial experiment by MIT attracted the attention of several other universities, who together created an online repository for OERs under the title of the Open Courseware Consortium (Carson, 2009). The OCW initiative had a further knock-on effect, influencing universities around the world to distribute their coursework online for free. In fact, the Indian platform studied in this project, NPTEL, started as a repository of OERs from the IITs (The Indian Institutes of Technology) (See **Section 2.7.1**). The once protective and elitist universities were releasing their courseware for free on the internet, not only for others to view and use, but also allowing other educators to adapt, remix, and share, under a Creative Commons Open license. The Cape Town Declaration of 2009 and the Paris OER Declaration of 2012 further provided governments and universities with guidelines and policies on how to distribute educational resources on an open license (Butcher & Moore, 2015).

However, despite significant investment from institutions like the Hewlett Foundation, UNESCO and the Commonwealth of Learning into promoting OER (Butcher & Moore, 2015, p. 16), there have been several challenges in mainstreaming the OER movement,

especially in the Global South (Hodgkinson-Williams & Arinto, 2017). As shown in **Figure 1** below, there were a series of challenges, Technical, Economical, Social, and Legal, that were predicted to affect the more widespread adoption of OER, many of which also could apply in the case of MOOCs.

Figure 1: Potential Challenges of OER in the Global South (Hodgkinson-Williams, 2010), Reproduced from (Butcher and Moore, 2015, p.15)

	Potential Challenges
Technical Issues	Lack of broadband and other technical innovations
	Interoperability
	Metadata standards
Economic Issues	Lack of resources to invest in broadband, hardware and software
	Difficulties in covering costs for developing OER or sustaining an OER project in the long run
Social Issues	Absence of technical skills
	Unwillingness to share or give away intellectual property
	Unwillingness to use resources produced by someone else
	Assuring quality in open content
	Lack of time to produce shareable materials
	Research privileged over the development of teaching materials
	Lack of incentives
	Skills to select appropriate OER and reuse or remix them
Legal Issues	Prohibition against using copyrighted material without consent
	Lack of awareness among academics regarding copyright issues

Significant investment and resources, mainly from Western philanthropic ventures, have been dedicated to facilitating the creation, adaptation and use of OER in the Global South.

One of the most notable studies of OER use in the Global South was the Research on OER for Development (ROER4D) project. This project surveyed thousands of educators in Africa, South America and Asia, and found that while participants in the study generally had favourable opinions on OER, there was a need for more localised, community-driven initiatives, to see the OER movement have a more significant impact in these contexts. As Hodgkinson-Williams and Arinto (2017, p. 589) conclude, "while equitable access remains a challenge in the Global South and should be addressed, it is in the realms of individual and community participation and empowerment that future OER interventions hold their greatest promise and will yield their largest gains. It is in those areas that broader inclusivity can be achieved and sustained.". A similar argument has been made for the creation of more localised MOOCs in the Global South, avoiding the 'neo-colonial' aspects of MOOCs (Altbach, 2014), and attempting to prevent MOOCs from "exacerbating existing educational divisions and deepening the homogeneity of global knowledge systems" (Czerniewicz, Deacon, Small, & Walji, 2014). The issue of MOOCs and the potential cultural imperialism imposed by them is discussed in greater detail in **Section 3.2.1**

2.1.3 Connectivism and Connectivist MOOCs

Several pedagogies have been utilised in distance learning to suit the particular context and technological constraints of the time. For most of the 20th century, with most technologies limited to a 'one to many', broadcast type model, distance learning pedagogy was dominated by Cognitive-Behaviourism. Behaviourist theory can largely be attributed to the work of American psychologists Watson, Skinner, and Thorndike, where learning is broadly defined as changes in a learners' behaviour as a result of a response to a specific stimuli (Anderson & Dron, 2011), and has been adapted to distance learning through Gagne's model of instructional design (Gagne & Briggs, 1974). Cognitive theory emerged as a result of advances in understanding of how the brain perceives and makes sense of the world, and Cognitive-Behaviourist theory represented the 'first generation of individualized distance education' (Anderson & Dron, 2011, p. 84), with the emphasis on the individual rather than the teacher or the social interactions of learners.

Social-Constructivism, as posited by Piaget, emphasises the social nature of learning, where knowledge is not passively transmitted to learners, but rather an active process not

centred around content negotiation and meaning-making, with each learner constructing their knowledge based on past and new experiences (Kanuka & Anderson, 2008). Unlike earlier pedagogies, Social-Constructivism, in its many forms, believes that knowledge does not reside in content, but rather through the experiences of the learners. Social constructivism positions teachers as active agents in the knowledge process, but within distance learning, particularly in the early years of the internet, this pedagogical approach was often unfeasible and un-scalable compared to earlier transmission based models (Annand, 1999).

Connectivism emerged as a direct response to the limitations of earlier pedagogical approaches towards distance learning and stressed the importance of distributed knowledge and networked connections to learning. Proposed by Siemens (2004) and further developed by Downes (2004) as a learning theory for the digital age, the theory proposes a number of different methods by which individuals learn in the 21st Century, and is very much a product of the affordances of Web 2.0, which produced a series of tools that "harnesses the Web in a more interactive and collaborative manner, emphasizing peers' social interaction and collective intelligence, and presents new opportunities for leveraging the Web and engaging its users more effectively." (Murugesan, 2007, p. 34). Learners could use tools like blogs, RSS feeds, later Twitter and other social networks, to become active participants in their learning, and form communities to learn collectively.

According to the theory of connectivism, there are significant shifts in the purpose of learning in society, where informal lifelong learning will supersede the more traditional formal learning environments, stressing that rather than understanding 'how' and 'what', learners must be prepared to know 'where' to access knowledge. Fundamental to connectivist pedagogy are two skills: the ability to seek out current information, and the ability to filter out secondary and extraneous information (Kop & Hill, 2008, p. 2).

Between 2004-2008, the concept of connectivism was further developed, often using active educational blogging circles to publish and engage in academic dialogue. The culmination of this was the creation of an online course *Connectivism and Connected Knowledge (CCK08),* run collaboratively by Siemens and Downes. This course was run formally at the University of Manitoba, but also had open (free) enrolment for informal learners around

the world, eventually attracting just over 2000 enrolments (Fini, 2009). While not the first open online course, it was unique in its use of several technological tools, and learner discussions were distributed across the web. The term Massive Open Online Course (MOOC) originated through one of these learner discussions, and the CCK course was henceforth known as the first MOOC (Mackness, Mak, & Williams, 2010; Milligan, Littlejohn, & Margaryan, 2013).

A number of connectivist MOOCs have run since, most notably: Personal Learning Environments and Networks and Knowledge (PLENK10), EduMOOC 2011, Change: Education, Learning and Technology (Change11), Learning Analytics and Knowledge (LAK12), educational technology MOOC (etMOOC13), MobiMOOC (Rodriguez, 2013, p. 66) and so on. Most of these connectivist MOOCs have comparatively smaller enrolments, often in the low thousands (Fini, 2009; Yeager, Hurley-dasgupta, & Bliss, 2013), and as is evident from the title of most of these courses, education and learning are key themes. Unlike traditional teacher-centred learning, these courses heavily relied on self-directed learning, and by its very distributed nature, expect learners to possess the skills needed to make connections within the network, and gain learning specific to their needs and requirements, rather than the top-down approach. A more detailed discussion of the literature around connectivist MOOCs, the learner experience, and some of the challenges of this approach to learning, will be explored in **Chapter 3**.

2.1.4 The Mainstreaming of MOOCs

In 2011, two Stanford professors, Sebastian Thrun and Peter Norvig, released their graduate level Artificial Intelligence class *CS221: Introduction to Artificial Intelligence* online (Rodriguez, 2012). While Stanford had been involved in the broader OER movement, and had created a portal *Stanford Engineering Everywhere* in 2008 to release course materials online on a Creative Commons license, this experiment by Thrun and Norvig was unique, in that it would function as a *course*, following a weekly timeline, and have learners complete assignments online and be automatically graded for the same. The course ran between October and December, and by the end, had over 160,000 enrolments, 20,000 of which completed all the coursework (Rodriguez, 2012). The ability of this course to attract

such a vast number of enrolments lead Thrun and Norvig to leave Stanford and create the Udacity platform.

The success of the Artificial Intelligence course led to the creation of key competitors to Udacity. Stanford professors Koller and Ng formed the for-profit Coursera, while MIT and Harvard collaborated to form edX – arguably the two biggest mainstream MOOC platforms in the West. While Udacity focused on just a few university and industry partners to develop content, both Coursera and edX focused on partnering with universities across the world, who themselves were keen to join this movement. This platform-partner relationship would largely be maintained across most MOOC platforms around the world, where partner universities would bear the costs of designing and developing courses, while the platform took a cut of the profits in exchange for hosting the courses.

At this point, a distinction must be made clear. In the first months of Coursera and edX, neither company referred to itself as "MOOC platforms". As is evident, the distributed, network-focused connectivist MOOCs were entirely different from the content-focused, university-driven courses from Coursera and edX. At some point in 2012, likely through ed-tech journalism, the term MOOC was used in describing the latter courses. Since then, there have been some who have argued that the term MOOC was hijacked by these new companies, leading to a formal distinction between the connectivist 'cMOOCs' and the Coursera-like xMOOCs (Smith & Eng, 2013). During this period, there was a proliferation of MOOC related terms and categories, such as xMOOCs, cMOOCs, SPOCs (Small Private Online Courses), BOCs (Badged Open Courses) and more. While some of these terms will be revisited in the following sections, for this study, the term 'MOOC' refers to the Coursera-like courses, delivered online through a centralised platform, usually with free access to the mostly video-based content, with some form of automated assessment.

Significant sums of money were invested in 'the big three' MOOC platforms in 2012. Udacity raised $20 million in two rounds of Venture Capital Funding in 2012 (Udacity, 2012), Coursera raised $22 million (Coursera, 2012), and edX was set up with an investment of $60 million from MIT and Harvard (Rodrik, 2012). These investments led to significant media interest in MOOCs, culminating with the New York Times calling 2012 'The Year of the MOOC' (Pappano, 2012). Selwyn, Bulfin and Pangrazio (2015) considered the media

discourse around MOOCs from 2011 to 2013 and found the notion of MOOCs as agents of 'change' in higher education to be one of the most frequently occurring themes. Language such as 'shaking up', 'revolution', 'transform', 'disruptive' 'paradigm shift' dominated the journalistic discourse around MOOCs during this period (Selwyn, Bulfin, & Pangrazio, 2015, p. 182). Further, the use of strong metaphors was incorporated to describe the supposed change in higher education brought about by MOOCs. Among the more popular metaphors was that of MOOCs as a "tsunami" of change, quoting a piece from Times Higher Education(2015, p. 183), "traditional universities need to get into (MOOCs), rather than be like King Canute trying to hold back the waves".

This hyperbolic narrative was primarily driven by the promoters of the MOOC platforms, often just before a round of funding, in order to generate interest and build hype around their platforms. This led to headlines calling MOOCs *'The End of University As We Know It'*, and claims such as those by Thrun that in the future "there will be only ten institutions in the world delivering higher education" (Leckart, 2012). In a vicious circle, the media narrative forced university administrators to seriously consider offering MOOCs for fear of missing out (Watters, 2012), and this, in turn, created the perfect market for several MOOC platforms to be developed around the world.

2.1.5 Summary

This section laid out the foundational history of distance education and MOOCs: From the early forms of distance learning which gave the opportunity to the disenfranchised to participate in learning, to the idea of opening up educational content for free through OERs and OCW, and to the eventual conceptualisation of Connectivism and the creation of the first MOOC in 2008. As discussed earlier, it is quite contentious to argue where the MOOC, as we know it today, truly started. As this study focuses more on the Coursera-type MOOCs, it was crucial to outline their histories, and how media hype raised the expectations of what MOOCs could do to the higher educational landscape. The following section explores in more detail to what extent the promise of MOOCs was actualised.

2.2 The Promise and Reality of MOOCs

Between 2012 and present, MOOCs have had time to experiment and mature, and researchers have had the time to carefully study MOOCs and gauge their progress, as well as their limitations. Media interest in MOOCs has significantly sobered, with one study finding that by 2014, MOOC coverage had dropped almost 50% from the previous year (Kovanovic et al., 2015). More importantly, some media were becoming critical of MOOCs, particularly on its failure to deliver the 'revolution in education' that was promised back in 2012 (ibid., p. 16). This section will briefly try to identify some of the main factors that may have impacted this public perception of MOOCs. **Section 2.2.1** discusses the challenge of completion rates in MOOCs. **Section 2.2.2** outlines the changes in the economic model of MOOCs, and what that might mean in the broader picture of open education as outlined in the previous section. **Section 2.2.3** discusses concerns around assessment in MOOCs and the challenges of cheating in an online course. Lastly, **Section 2.2.4** discusses how employers view MOOCs and their certifications, and the general credibility of MOOC certification.

2.2.1 Completion Rates

From its inception, one of the main concerns voiced by MOOC sceptics was that their completion rates were significantly lower than for other forms of learning. Completion rates are a key metric used to determine the success of a course, and dropouts have always been higher in traditional online courses compared to on-site courses (Kizilcec & Halawa, 2015). MOOCs, with their open enrolment and massive scale, are hence bound to have similarly low completion rates. While exact figures across all platforms are unknown, using openly available resources, Jordan (2014) found the average class size to be just over 40,000, with the median completion rate across all courses being 6.5%. While these numbers were primarily based on Coursera and edX courses, many further reports have identified single-digit completion rates across several courses (Belanger & Thronton, 2013; Khalil & Ebner, 2014).

Completion rates as a metric of MOOC success has been a contentious issue and are mostly rejected by many researchers in the field. McAuley et al. (2010) suggest that learners enrol in a MOOC for a variety of reasons, and for most learners, completion, defined as

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completing a majority of the course or receiving certification for the same, may not be as important. In fact, on average close to half of MOOC enrollees never access the course content after signing up (Breslow et al., 2013; Kizilcec, Piech, & Schneider, 2013). One of the main areas of research, particularly in the field of learning analytics, is the issue of persistence in MOOCs, and how to leverage the enormous amounts of data generated during courses to attempt to identify which factors affect learner persistence in courses (Halawa, Greene, & Mitchell, 2014). Discussion of the current state of MOOC research into learner motivations will occur in **Section 3.3**. While research shows that completion is not a suitable proxy for measuring learning in a MOOC (Littlejohn, Hood, Milligan, & Mustain, 2016; Pursel, Zhang, Jablokow, Choi, & Velegol, 2016), nonetheless, the low completion rates of MOOCs are often cited in the media as one of the main reasons MOOCs have not had as much impact as was predicted between 2012-2014.

2.2.2 The Economics of MOOCs – Moving Away from Openness?

> *"Many "MOOCs" are neither open nor massive, but often simply regular online courses that have been re-branded." (Godwin-Jones, 2014, p. 5)*

While MOOCs had their beginnings as completely free offerings from various universities, it was clear that considerable investment, particularly from venture capitalists, had been made in developing and running these courses, specifically on the Coursera and Udacity platforms, and at some point, the investors would want to see a return on their investment. The primary monetisation strategy of most MOOC platforms was to provide some form of verified certification for a premium cost. The price of these certificates varied between 25-100 depending on the course and the platform, and unlike the free statements of participation that was offered to all that completed a course, had the name of the partner institution on them, supposedly adding further credibility to the credential. A secondary monetisation strategy used by most MOOC platforms was the creation of 'specialisations' -a clustering of a series of individual MOOCs into a more comprehensive package, once again for a premium cost (Taneja & Goel, 2014).

As the MOOC platforms attempt to generate revenue through these strategies, they have had to gradually pull back on the free offerings to learners. Udacity was the first to flip its model, dropping the free statement of completion for a premium monthly subscription-

based model, which, along with the certification, offered personalised feedback from a tutor. (Udacity, 2014). edX too phased out its free 'honour code certificates' in 2015 (EdX, 2015), and Coursera has gone a step further and closed free access to assessment (through multiple choice and peer grading), allowing learners to 'explore' for free, but requiring a fee to do anything beyond viewing videos (Coursera, 2016a). These shifts have been motivated by the need to make MOOCs profitable to satisfy investors but may have come at the cost of losing one of the key features that allowed these platforms to boast about their enrolment numbers in the first place.

While the 'free' delivery of courses was often considered one of the critical elements of MOOCs as 'democratisers' of education (A. Agarwal, 2013), the focus on monetisation, instead of sustainability has raised questions about the real purpose behind MOOCs. Even the usage of the term *open* in MOOCs has been found to be problematic (Weller, 2015) especially by those who questioned the level of *openness* of MOOCs (Anderson, 2013; Peter & Deimann, 2013). If most MOOCs were to be judged by the prevailing *4'R's of Openness* framework (Hilton III, Wiley, Stein, & Johnson, 2010, p. 39) of '*Reuse, Redistribute, Revise and Remix*', they would fall short at the most basic level of 'Reuse'. Hence, an argument could be made that MOOCs were not part of the open education movement to begin with, and the constant increase of barriers and paywalls imposed by some MOOC platforms since then to try to get a return on their investment, seem to be transforming MOOCs into yet another commercial online courseware provider (Caulfield, 2013), rather than potential *disruptive democratisers of education.*

2.2.3 Assessment and Cheating in MOOCs

A concern for universities considering providing formal credit for MOOC study is the fear of cheating, and how easy it could be to manipulate the assessment tasks to earn a certificate. One study found that among the 69 MOOCs studied, over 1200 certificates, or 1.3% of all certificates, involved learners creating multiple accounts to find the right answers and feed them into their main account (Northcutt, Ho, & Chuang, 2016), with another study estimating that figure at 2% (Bao, Chen, & Hauff, 2017). Among the more 'active' MOOC learners with over 20 certificates, almost 25% had used this cheating strategy.

In another study, almost 10% of all certificate recipients had used this strategy to 'harvest' answers from multiple accounts (Alexandron, Ruiperez-Valiente, & Pritchard, 2015). In order to combat such methods of cheating, and to verify the identity of the person completing assessment tasks, MOOC providers like Coursera and edX have learners turn on their webcams while submitting work, and also use biometrics to measure keystroke dynamics and identify distinctive patterns of typing. However, even this supposedly advanced technology has its flaws and has the potential to be easily gamed by learners (Dehaye, 2016). While cheating might not be one of the biggest concerns of universities and employers, they could potentially delegitimise the MOOC credential over a formally earned one and could have played a role in preventing MOOCs from gaining more mainstream recognition.

2.2.4 MOOCs and Employability

In a study of Coursera users, fifty-two per cent of over 50,000 users surveyed reported that their primary goal for taking a MOOC was to improve or find a new job, of which 33% reported tangible career benefits from taking a MOOC (Zhenghao et al., 2015). Therefore, while universities might be apprehensive on formalising MOOC credentials, it is also worth considering employers and their attitudes towards MOOCs. One of the concerns with distance education more generally, and MOOCs specifically, is the notion that these courses are not rigorous enough, and that employers are less likely to accept MOOC certification over traditional qualifications.

A survey of nearly 400 employers across varied disciplines in a US state found that while 31 per cent had heard of MOOCs, only one organisation had actively used MOOCs for recruitment (Radford et al., 2014). The study goes on to suggest that a majority of employers viewed MOOCs very positively, and just over half of the organisations could see themselves potentially using MOOC certification for recruitment. While this study is encouraging to MOOC providers, it was based in just a single state of the US, and so the results may not be generalisable, especially in the Global South, where awareness of MOOCs may still be limited. Another study on K-12 employers' perceptions of MOOCs had more mixed results, with employers generally unlikely to consider MOOC certification in lieu of traditional degrees (Webb, 2015). Similarly, another study in 2016 found that while

employees felt MOOC credentials were critical to their reasons for enrolling, they were not as readily accepted by the relevant stakeholders as a measure of workplace learning (Egloffstein & Ifenthaler, 2017).

In technology, design, and entertainment fields, employers have already started accepting alternative forms of credentialing – portfolios, digital badges, as well as verified online certification(Welsh & Dragusin, 2013). However, the broader acceptance of MOOC certification by employers is key to increasing the adoption of MOOCs, and further research is needed to understand employer's perceptions of MOOC credentials, especially in countries like India, which have a significant shortage of skilled graduates, as will be explored in **Section 2.5.2**.

2.2.5 Summary

This section outlined some of the critical challenges that have affected MOOCs since their inception, which have impacted their credibility and stunted their more mainstream adoption. While MOOC providers were quick to highlight their enrolment figures on some of their earlier courses, single-digit completion rates have had a negative impact on the media coverage of MOOCs, despite researchers almost unanimously agreeing that completion rates are not the most accurate measure of success in a MOOC. While MOOCs often highlighted that their courses were free, and would disrupt higher education by levelling the playing field, the economic realities of private venture funded initiatives have meant a steady decline in access to materials, with some content, assessment and certification being gated behind paywalls. Perhaps most important is the perceived value of MOOC certification. Despite state-of-the-art techniques to track potential cheating behaviour in MOOCs, there is still the issue of cheating through multiple accounts. This level of perceived cheating, over and above existing biases towards online certification, has limited the perceived value of MOOC certificates from employers.

These issues were highlighted, in particular, as even though they have affected global perceptions of MOOCs, in many cases, these issues are amplified in a Global South context like India. Many of these themes were identified in the findings of this study, and the implications of the 'reality' of MOOCs, particularly Global platforms, of not living up to the hype of 2012, could have had cascading effects to learners from India.

2.3 MOOCs in Formal Learning

Between 2012 and present, many attempts have been made around the world at incorporating MOOCs, or elements of MOOCs, within the formal structure of higher education. The primary driver for this is the broader concern over the affordability of higher education, particularly in the US. While covering every instance of MOOC use in formal higher education is beyond the scope of this chapter, this section will briefly outline some of the main initiatives and their outcomes. Broadly speaking, there are three main methods by which universities have attempted to bring MOOCs into the formal classroom. First is through the 'flipped' course method, second is through allowing MOOCs for partial credit towards a degree, and lastly is the full-MOOC degree. This section focused on all three of these aspects and their relative success. This is important in the context of this study, as will be discussed in **Section 2.6**, MOOCs are increasingly being utilised within formal learning in India.

2.3.1 Flipped MOOCs

While there is not a standard model for the flipped classroom, they typically involve using online resources to deliver lectures that students can take at their own pace, while utilising face-to-face time to have dialogical engagement between the teacher and learner. There has been a steady increase in the use of the flipped model within formal higher learning, as well as academic research on flipped methodologies in a variety of disciplines (Lowell Bishop & Verleger, 2013). The idea of flipping the classroom is also the model most commonly used to incorporate MOOCs into formal higher education. There are various methods by which a class is 'flipped' through MOOCs, and researchers have devised a number of different classifications of flipped MOOCs (Israel, 2015; Pérez-Sanagustín, Hilliger, Alario-Hoyos, Kloos, & Rayyan, 2017) – and the MOOCs used in this format are sometimes known as SPOCs or Small Private Online Courses.

While the full extent of the usage of MOOCs in this flipped model cannot be ascertained entirely (Pérez-Sanagustín et al., 2017, p. 6), several academic studies have reported on their experience of using flipped MOOCs at their institutions. These include the usage of a machine learning MOOC for a graduate level course at Vanderbilt University (Bruff, Fisher, Mcewen, & Smith, 2013), integrating the use of STEM SPOCs with their face-to-face

remedial courses for university freshmen at the Universidad Carlos III de Madrid (Delgado Kloos, Munoz-Merino, Alario-Hoyos, Estevez Ayres, & Fernandez-Panadero, 2015), using an existing MOOC to flip a sociology class at the University of Western Australia (Forsey, Low, & Glance, 2013), and flipping Computer Science UC Berkeley edX MOOCs in a number of universities across the US (Fox et al., 2014). While some of these flipped initiatives have been positively received by both students as well as instructors (Soffer & Cohen, 2015), a review of the literature on flipped MOOCs has suggested that they overall have lower satisfaction rates compared to the fully on-campus version of the course (Israel, 2015), with minimal participation on the MOOC discussion forums by the flipped cohorts. At the same time, students perform equal to or slightly better on a flipped MOOC compared with a purely face-to-face course (ibid. p.115). These findings should be considered when, in the Indian context, the government is promoting the use of the flipped MOOC model in many of its universities.

2.3.2 MOOCs towards a formal degree

There have been a few attempts to offer part of a degree through MOOCs, followed up with the rest of the curriculum through traditional face-to-face means. In 2015, Arizona State University partnered with edX to offer what it termed the "Global Freshman Academy", where learners could get up to a full year's worth of college credit through edX MOOCs, with a full year's worth of eight courses costing just under $6000 (Lewin, 2015). The Texas State University System too partnered with edX to allow students to take select Advanced Placement online courses for free, and provided they pass a College Level Examination Program (CLEP) test, could get credit for up to a year's worth of study[1] Similarly, MIT has run a 'MicroMaster's' program in supply chain management, where learners can earn half their degree from MOOCs.

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[1] Source: https://www.tsus.edu/newsroom/news-releases/release-091015.html, Retrieved 20 May, 2019

While the outcome of these programs is still unknown, one initiative launched in 2013 as a partnership between Udacity and San Jose State University was unsuccessful and had to be put on hold mere months after launching. Known as SJSU+, the program offered students the chance to take MOOC versions of otherwise on-campus maths courses, for a fee of $150 per course. While the on-campus version of the courses had a completion rate of 74 per cent, the figure was just over 50 per cent for the Udacity students – and hence was put on pause (Rivard, 2013b). On the one hand, these initiatives offer students a somewhat discounted rate at a formal degree by offsetting some of the cost with MOOCs. However, at the same time, it begs the question about why the pricing of the face-to-face modules should be significantly higher than the MOOC, both of which gave students the same credit towards their degree. While these issues of cost are more pertinent in the West, in India, considerable efforts have been made to use MOOC credit towards formal degrees (University Grants Commission, 2016), and will be discussed in **Section 2.6**.

2.3.3 Full MOOC Degree

A recent trend among many MOOC providers is to offer complete degrees to learners via MOOCs. One early attempt to create a MOOC-only degree was through a partnership with Georgia Institute of Technology and Udacity in 2013 – in creating a $7000 fully- online master's degree, a sixth of the price of its on-campus equivalent (Rivard, 2013a). Enrolment was not open, there was an admissions process, and the courses were not MOOCs available openly to the broader public, but instead closed courses developed by Georgia Tech. As one commentator (Alexander, 2013) noted, the only MOOC-like element of the scheme was the considerably higher student to staff ratio, and the likely less contact time learners will receive with tutors, hence the lower cost than traditional web-based degrees. As the Master's programme had its first set of graduates in 2016, some of the claims made about the project had to be toned down. While the courses were overall considered a success, they have not attracted close to as many students that they had projected. Initially hoping to host 10,000 students in a single cohort, the degree had just over 3000 learners enrolled (Straumsheim, 2016).

Despite this, MOOC degrees are becoming more popular over time. By 2017 there were 9 Master's degrees offered entirely through MOOCs, and by early 2019, that number has risen

to 36 (Pickard, 2019). FutureLearn offers 15 degrees, Coursera offers 13 and edX offers 7. These courses, while still considerably cheaper than the regular price of a formal degree, often cost between $10,000 and $22,000. So, despite being entirely MOOC based, these degrees are still relatively expensive and out of reach of most learners from disadvantaged backgrounds.

2.4 MOOCs in the Global South

While an overwhelming majority of research around MOOCs tends to look at the large US-based platforms and data collected within those platforms (Veletsianos & Shepherdson, 2016), there has also been a steady rise in MOOC platforms and partners around the world. An overview of all global initiatives is beyond the scope of this thesis. However, this section considers some of the development of MOOCs in the Global South, with specific reference to China, due to its size and similarities with the Indian context.

2.4.1 MOOCs around the World

Since the growth of MOOCs in the West, many South American nations have developed their own platforms, and have adapted MOOCs to their contexts. The Veduca platform, for instance, is the largest MOOC platform in Brazil, privately funded and run in collaboration with the University of Sao Paulo (Machado de Campos, Henriques, & Yanaze, 2016) delivering MOOCs as well as MOOC-based degrees to learners in Portuguese. The MOOCs on this platform are certified by the Brazilian Ministry of Education, and they have run an entirely online MBA for $3000, with a 50% success rate (Deucher, 2014), providing Brazilian learners with a cheaper alternative to a traditional degree. In Spanish-speaking Latin America, the MiriadaX platform emerged as the leading MOOC developer, through a collaboration between Spain and Latin America (Trejo, 2017).

Interestingly, the platform still offered free certification to learners, and also followed a 'karma' system, where:

> Students can collaborate actively in the course development beyond the well-known discussion forums: they can contribute as content writers in the course wikis, blogs, and FAQs. More impactful contributions mean more karma points,

which mean more prestige within the community and a better position in the "expert" ranking system. (ibid.)

Unfortunately, there are limited English academic studies on the work of MiriadaX and Veduca. Hence not much is known about the effectiveness of these platforms. However, the use of gamification techniques to increase engagement in MOOCs shows the unique and innovative ways MOOCs are run in different parts of the world to cater to their specific cultural context.

In the Middle East, the Edraak platform runs courses for Arabic-speaking countries, in collaboration with edX and the Queen Rania Foundation for Education and Development (Sallam, 2017), while the Rwaq platform delivers MOOCs predominantly from Saudi Arabia. The Edraak platform further translates popular edX MOOCs into Arabic. A comparison of learner experiences of Arab-country learners between Edraak and edX showed that learners on the Arabic platform had greater completion rates in locally produced MOOCs, attracted learners with lower levels of formal education, and had a better gender balance compared to the global edX platform (Ruipérez-Valiente, Halawa, & Reich, 2019). These findings would suggest that locally produced MOOCs have an advantage over their Western counterparts, and likely have a more significant impact from a social justice and developmental background. However, while the Middle-East has the advantage of uniformity of language, the plurality of languages present in India compel Indian MOOC developers to deliver courses predominantly in English, with localised subtitles. The implications of this are discussed in greater detail in **Section 3.2.1**.

While MOOC platforms have emerged across the world, there has yet to be a MOOC platform developed in Africa. Learners from the entire continent of Africa accounted for just 2% of Coursera enrolments in 2014 (Gloy, 2018), with the high cost of production of a MOOC being cited as one of the main barriers for African universities to create their own MOOCs. While initiatives that use Western MOOCs in a blended-format to assist teachers, such as the Kepler program in Rwanda (Wildavsky, 2014) have seen limited success, much like the OER initiatives outlined in **Section 2.1.2**, these programs are Western-funded, and there is arguably a need for more localised content to be created, and for infrastructure and systems to be put in place in partnership with local institutions to sustain these

programs once the funding runs out. One exception in the African context is the University of Cape Town, which has launched several courses on Coursera as well as FutureLearn. Off the first two courses launched on FutureLearn, the University of Cape Town MOOCs had 20% participation from African learners, compared to the 4% of all learners on FutureLearn (Czerniewicz, Deacon, Glover, & Walji, 2016, p. 2), even though neither of the two courses had a specific relation to the African context. This suggests that the country of origin of a course might influence the demographics of the learners that participate in it, further supporting the benefits of localised MOOCs. It must be stressed though, that the University of Cape Town is very much an outlier in this regard, and MOOCs have not yet had the sort of impact in Africa, as they have had in China and India, as the following sections will outline.

2.4.2 MOOCs in China

China currently has the most extensive higher education system in the world and has been at the forefront of adopting MOOCs and localising content for their learners. Elite Chinese universities have signed up with the larger MOOC platforms of edX and Coursera and were offering more than 140 English courses from 12 universities (Shen, Ye, Wang, & Zhao, 2016). This can be seen as an indirect method for these universities to increase their global reputation, while at the same time, sharing knowledge about Chinese culture, history and art (ibid., p. 1107). Due to most Chinese learners' language needs, several Western courses from edX and Coursera have been licensed and translated. These courses run on the Chinese platform with Chinese instructors and tutors, while the course material is borrowed from the Western institution (Cheng, 2014). As much of the literature on this subject is in Chinese, it is unclear to what extent the courses are repurposed or recontextualised for the Chinese audience.

The first and largest Chinese local MOOC platform is XuetangX, formed at Tsinghua University with a localised version of the Open-edX platform. As of October 2016, the platform had over 5 million enrolments, and over 400 courses, and had been experiencing exponential growth in learners (Shah, 2016). Besides creating MOOCs for the public, XuetangX has also been involved with creating SPOCs (Small Private Online Courses) with its partner universities, where professors can use content from the MOOCs to deliver

courses in a blended format (Shah, 2016). Most importantly, 42 courses (in 2016) from the XuetangX platform can be taken for formal credit by learners at any of their partner universities, with over 24,000 students already choosing to do so (Shah, 2016). This shows a desire to formalise MOOCs and incorporate them within the existing structure of higher education, similar to what is occurring in the Indian context.

Apart from XuetangX, there have been several smaller MOOC platforms developed in China, such as CNMOOC by Shanghai Jiaotong University, China University MOOC by NetEase, and Chinese MOOC, a platform created in partnership between Peking University and Alibaba (Xiang, 2015). However, many of these platforms would not necessarily conform to the definition of MOOC as per Western standards – in fact, the term MOOC has been adapted to nearly any form of online learning in China (Reich, 2015). Nevertheless, the widespread adoption and substantial financial investment by public and private sectors in MOOCs suggest that there is a massive opportunity in China and that learners seem to be making productive use of MOOCs.

2.4.3 Summary

This section briefly touched on the various MOOC initiatives in the Global South, in order to show that despite the Western-dominated literature on MOOCs, there is a vibrant range of MOOC usage occurring across the world. Different methods of MOOC design and implementation were seen in varied contexts. From the use of gamification techniques on MiriadaX in Latin America, to the use of Western MOOCs to empower learners in Rwanda. From the translation of Western MOOCs into Arabic and Chinese, to the use of SPOCs in formal educational settings in China; all show that the Coursera-type MOOC model is not necessarily the only way to run MOOCs and that with adequate funding, institutions from the Global South can create and run their own MOOCs, fit for their context. It further raises the importance for research into these various initiatives to be a part of the broader English-language literature, to enrich our understanding of the different ways in which MOOCs are being used around the world.

2.5 The Indian Context

This study involves researching MOOCs in the Indian context, not just in the realm of lifelong learning, but also considering what is the role MOOCs within the formal structure

of Indian Higher Education, because of the broader Government scheme to formalise MOOC credentials (University Grants Commission, 2016). This section provides the reader with a contextual background to the Indian Higher Education system, with a focus on the challenges it currently faces.

2.5.1 Indian Higher Education

The Indian Higher Education system is currently the third largest in the world, with over 26,000 institutions of higher learning (504 universities and 25951 colleges) (Gupta & Gupta, 2012). Despite this, only 24.5 per cent of university-age Indians are in an institute of higher education[2], compared to 59.4% in the UK[3]. The advent of MOOCs, with their ambitious initial promises, has attracted significant interest in India, particularly from the Indian Institutes of Technology (IITs). On the global front, demographic data has shown that Indians make up the largest single cohort of MOOC participants, after the US and UK, in the two biggest MOOC platforms of Coursera and edX (Nair, 2013), which has generated further interest in MOOCs, both from the media as well as the government. With a majority of the population under the age of 25, and with India poised to outpace China in 2020 as the country with the largest university-age population (British Council, 2014b), there is a need to develop the infrastructure capable of cultivating a quality education system, that can quickly and affordably scale up a high-quality learning experience, that not only imparts knowledge to learners, but prepares them for the challenges of the 21st century workplace. However, currently, several challenges are facing Indian Higher Education that is restricting its ambitions, which MOOCs could potentially play a role in improving.

2.5.2 Challenges Facing Indian Higher Education

The following section outlines some of the critical challenges currently facing Indian Higher Education as identified by a British Council report (2014b), and identifies what role, if any, could MOOCs potentially have in alleviating some of these challenges.

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[2] Source: https://data.gov.in/catalog/gross-enrolment-ratio-ger-higher-educationRetrieved May 20, 2019
[3] Source: http://uis.unesco.org/country/GB Retrieved May 20, 2019

2.5.2.1 The Supply-Demand Gap

As outlined in the preceding section, India has a comparatively low rate of enrolment in higher education at just under 25%, even when compared to similar developing economies of China[4] with 51.01% and Brazil[5] with 50.49%. There is an enormous demand for higher education that is currently unmet. By 2020, the Indian government aims to achieve 30% gross enrolment, which would mean introducing millions of more learners into the higher education system. Furthermore, these issues are compounded by a distinct shortage of faculty in higher education. Various reports estimate that 30-40% of faculty positions remain unfilled (Ernst and Young, 2013) including at some of the premier national universities. One report (FICCI, 2014) quotes the Vice-Chancellor of Allahabad University, mentioning that the youngest faculty member at his university is 55 years old. This could suggest that not only does India require a significant number of teachers in higher education, but it also highlights that some of the current higher education faculty share a different world-view to the current realities of the 21st century, and there could be a need to bring in more progressive attitudes towards teaching and learning. This shortage of faculty has led universities to narrow their offerings, reducing the diversity of Indian graduates, and leading to a saturated market for STEM graduates and MBAs (British Council, 2014b).

One of the key affordances of MOOCs is the ability to scale up learning without incurring significant cost differentials. Instructors have the opportunity to deliver courses to hundreds of thousands of learners. The FICCI (2014) report argues that while MOOCs are not poised to replace the classroom in India, they could be used in the formal sector in a blended approach to allow for professors to reach a more extensive number of learners, while at the same time improving levels of learner satisfaction through the use of flipped lectures.

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[4] Source: http://uis.unesco.org/country/CN Retrieved May 20, 2019
[5] Source: http://uis.unesco.org/country/BR Retrieved May 20, 2019

2.5.2.2 Low-Quality Teaching and Learning

Indian Higher Education system is beset by issues of quality in many of its institutions: a chronic shortage of faculty, poor quality teaching, outdated and rigid curricula and pedagogy, lack of accountability and quality assurance and separation of research and teaching (British Council, 2014b). This has led to some questioning the value a degree holds in India. University graduates in India are largely seen as lacking in practical skills required for the workplace. Infosys, a major Indian IT company, which had over 1.3 million applicants for jobs in 2007, said it found only two per cent of applications "acceptable" (Surowiechi, 2007). Similarly, studies have found that less than 17 per cent of India's overall graduates (Arnoldy, 2012) and only 7 per cent of MBAs (ASSOCHAM, 2016) were immediately employable. This suggests that beyond the elite universities, only a handful of institutions produce graduates that may be deemed ready for the workplace without requiring additional on-the-job training.

The low quality of teaching leads to many students who get scholarships, or who can afford the higher tuition costs, to get a higher education degree from a foreign institution. An employability survey run by the British Council in 2014 found that employers in India generally viewed those with foreign-based degrees as having a "substantial edge" over those who graduated locally, on a range of skills that firms sought in their employees (British Council, 2014a). This lack of employability is further aggravated by brain drain, where graduates from some of the top institutions in the country take up lucrative jobs abroad after graduating. A recent study of all IIT graduates found that a third of them were based outside of India (P. Agarwal, 2009; Dukkipati, 2010). There is, therefore, a need for Indian Higher Education to improve their curricula as well as the quality of their teaching and learning to keep up with the demands of the 21st century, and to ensure graduates are prepared for the challenges of the workplace.

Most learners in India, however, cannot afford to study overseas. MOOCs could allow these learners to experience learning at a foreign institution. While there may remain pedagogical issues within MOOCs, without improvement in the quality of teaching and learning, and subsequent employability of Indian graduates, organisations might begin to consider alternate forms of qualifications, including MOOCs (FICCI, 2014), alongside local

qualifications, provided candidates can prove they possess the appropriate skills and competencies they require.

2.5.2.3 Uneven growth and Access

Socially, India remains highly divided. Access to higher education is uneven with multidimensional inequalities in enrolment across population groups and geographies. There is a significant difference in the quality of rural and urban institutions, with wide variation between states (British Council, 2014b). While India has one of the broadest and more controversial affirmative action policies (Deshpande 2006), with reservations for minorities and other backward classes (OBCs[6]), these groups are still proportionally underrepresented in higher education (British Council, 2014b). These groups are often well-below the poverty line, and it is questionable to what extent, if any, would technology enhanced learning solutions like MOOCs benefit them. However, with a significant increase in mobile usage and smartphones estimated in the coming years (The Economic Times, 2015b), there is potential for mobile-based learning solutions, including locally produced MOOCs, to have a direct impact on communities that currently lack access to higher education.

2.5.3 Summary

This section highlighted the current state of Indian higher education. With India set to have the largest university-aged population, there is a need to find solutions to some of the critical challenges facing Indian higher education. There is both, a need to recruit a significantly greater number of teachers to keep up with the demand of the country, while at the same time ensuring that the quality of teaching and learning in the country is raised, and marginalised communities and rural populations are not ignored when developing solutions to these problems. Whether MOOCs are the answer to these challenges remains to be seen, and the following section highlights the development of MOOCs in India.

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[6] OBC is an official classification of the population of India, which collectively refers to castes that are educationally or socially disadvantaged. Source: https://en.wikipedia.org/wiki/Other_Backward_Class Retrieved May 20, 2019

2.6 MOOCs in India

From the success of the very first MOOCs in 2012, there has been significant interest in MOOCs in India. A 2015 study on media coverage of MOOCs found 84 articles related to MOOCs in India, the 11th most recurrent topic in media discussion (Kovanovic et al., 2015). While the narrative of MOOCs as disruptors of higher education has mostly diminished in Western media, Indian journalists continue to report on MOOCs as the rescuers of the broken Indian education system. For instance, headlines such as *Huge Opportunity for Online Learning in India*, with quotes like "Without a second thought, MOOCs are one of the most viable platforms for transforming the educational scenario in the country, especially in semi-urban and rural areas" (Behura, 2016) are commonplace, and rarely questioned in the broader journalistic discourse of education in India. This section presents several of the efforts taken by various initiatives to create and deliver MOOCs in India while exploring to what extent some of the bold claims made in the media have come to fruition.

2.6.1 Indian MOOCs on Global Platforms

In June 2013, IIT Bombay became the first Indian university to partner with edX (Hashmi, 2013). Under the leadership of Deepak Phatak, a renowned professor who was instrumental in setting up the first Computer Science department in India, the first MOOC "Introduction to Computer Programming" ran in July 2014, attracting over 35,000 learners (The Economic Times, 2014). This was the first Indian MOOC that was targeted at a global audience. While the course attracted plenty of learners from India, who seemed to be enthusiastic about the opportunity to learn from the IITs and Mr Phatak, course feedback was mixed. On the Coursetalk platform, where learners can leave anonymous reviews of MOOCs, learners mentioned bugs with the course assessment, as well as an absence of the course team during the course[7]. These reviews suggest that while the IITs had shown a desire to engage with MOOCs, there still were challenges that needed to be addressed with regards to successfully running MOOCs on a global level. While most of the reviewers of

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[7] See http://www.coursetalk.com/providers/edx/courses/cs1011x-introduction-to-computer-programming-part-1-2 for all the reviews left for the Course. Retrieved May 20, 2019

both the IIT edX MOOCs had the same complaints about the assessment, there was close to unanimous consent that the course content (video lectures) was of good quality. It is unclear whether the IITs plan to rerun these courses on edX, as of 2019 they are available as archived materials, but it would be interesting to observe what, if any, changes are implemented in the next iteration of the course, and whether some of the learner comments were addressed. Apart from IIT-Bombay, the Indian Institute of Management at Bangalore and the Indian School of Business have signed up with edX and Coursera respectively, and have delivered MOOCs that have had reasonable success. That being said, most of these courses are taken mainly by Indian learners themselves, and through the mixed response the IIT Bombay courses received on edX, there is a need for course developers on global platforms to design their courses around a wider audience, and not to replicate their on-campus coursework on a MOOC platform.

2.6.2 Small-scale MOOC Experiments

As universities in India began considering MOOCs, a few enterprising professors ran MOOCs as experiments to see the potential of this form of learning. In early 2013, two professors from the Indian Institute of Technology (at Kanpur and Ropar) collaboratively ran India's first MOOC – on software architecture and cloud computing. This course was not repurposed Open CourseWare, but rather, was custom built for the MOOC format, and had an optional certification that learners could receive, similar to NPTELs model, costing Rs. 1000 (around £10). There were just under 1000 participants, 470 of whom opted to pay for certification, of which 370 completed the course successfully (Devgun, 2013). While not at the `massive` scale as some of the more popular international MOOCs, this pilot course by the IITs was considered a relative success due to the significantly higher completion rates than the international MOOCs, which on average have been shown to have a completion rate of 6.5 per cent (Jordan, 2014). Similar smaller-scale MOOCs have been offered on topics such as "Mobiles for Development" and "MOOC on MOOCs", in collaboration with the Commonwealth of Learning (Perris, 2015) using the indigenously designed mooKIT platform (Chauhan, 2017).

Further to delivering MOOCs on the web, innovative approaches to course delivery have been experimented with within India to reach sections of society that are technologically

disadvantaged. The Commonwealth of Learning collaborated with IIT Kanpur to deliver a MOOC on horticulture to the *malis*, who are semi-skilled gardeners, that typically lack any form of higher education. This course was delivered in Hindi and was delivered through mobile phones. Learners could call a local number and hear a series of audio clips, and then gave answers to multiple choice questions on their phones. As this was an audio-only *course,* a basic non-smart mobile phone would be sufficient. The course attracted over 1000 participants, most of them full-time gardeners or farmers (Moloo, Prabhakar, Venkataraman, & Khedo, 2017). It could be argued that such a project is not a MOOC at all, but such innovative solutions that make use of the affordances of mobile technologies and reach segments of the Indian population that would otherwise have no way to benefit from MOOCs could be a potentially successful form of technology-enhanced learning for some contexts in the Global South.

2.6.3 TESS-India

TESS-India (Teacher Education through School Support in India) is a UK-India partnership, led by the Open University, UK, to "create an innovative Open Educational Resources (OER) teacher education toolkit in support of improvements in the classroom practices of teachers in multiple contexts around India" (Wolfenden, 2015). Restricted in its capacity to reach the large cohort of teacher educators spread around India, TESS-India ran a six-week long MOOC on the edX platform. The pilot course, run in 2015, attracted almost 3000 participants, while, more interestingly, 200 teacher educators were offered face-to-face contact sessions in addition to the MOOC, leading to an 80% completion rate amongst the latter group (Wolfenden, 2015). This form of supported delivery of the MOOC has continued in later iterations of the course and has led to regularly significantly higher than average completion rates of learners (Wolfenden, Cross, & Henry, 2016). To what extent this model of supported MOOC delivery is sustainable, and appropriate in other contexts, has yet to be explored, but this case does suggest a unique method of delivering MOOCs to learners who might otherwise not be able to take these courses.

Apart from its somewhat unique supported MOOC model, the TESS-India MOOCs demonstrate how global course designers (In this case, from the UK), can, with partnership with local initiatives, deliver courses that are contextually appropriate for the target

learners, and more importantly, takes into account the inherent challenges that learners from developing contexts might face when encountering online learning. The course designers chose not to use videos in their MOOC, due to concerns over limited broadband availability. The designers also were aware that learners were likely to be using mobile devices rather than computers to access the materials and created content better suited to learners with smaller screens (Wolfenden et al., 2016). In later iterations of the course, the content was also offered in Hindi, which increased the registrations from 1200 to over 3000 (Wolfenden et al., 2017). In these ways, the TESS-India courses have demonstrated the potential of contextually appropriate, cross-cultural delivery of MOOCs in the Global South.

2.6.4 IIT BombayX

IIT-Bombay, one of the leading engineering and computer science institutions in India, also started their own MOOC platform, named IIT BombayX. Specialising in Flipped MOOCs with numerous Regional Centres, the IIT BombayX platform delivers four distinct types of MOOCs for four distinct groups of learners. The first, termed EduMOOCs, is an extension of some of the undergraduate and postgraduate STEM degree courses offered on campus at IIT Bombay. These are MOOCs targeted towards engineering students across India. The second type of courses offered are SkillMOOCs, which has a primary focus on professional development, with courses ranging from Financial Literacy and Workplace Communication to Project Management. The third type of MOOCs offered by IIT Bombay are TeachMOOCs, which are designed to train teachers on various pedagogical methodologies. These courses are mostly hybrid in nature, where teachers would complete part of the course online, and then follow it up with an intensive face-to-face training session. Under the umbrella of the T10KT (Train 10,000 Teachers) project initiated by the Indian government, these courses are being used to train teachers to mentor students who enrol in the IIT MOOCs, and then use these courses in a blended format at their own institution. It allows the highest level of quality content from the IIT to trickle down to the smaller institutions, replacing the need for highly trained faculty.

This sort of model raises questions about the role of existing faculty, and whether these forms of blended learning will turn them into Teaching Assistants or Mentors. A similar

model of blending undergraduate courses through MOOCs was attempted in the US but was met with stiff resistance from one faculty who felt it undermined their positions at their institutions (Hartnett 2013). However, within the Indian context, this model could potentially have significant implications, especially because of the challenges in Indian Higher Education with regards to faculty shortage and poor pedagogy, as outlined in **Section 2.5.2.2**.

The last type of MOOC offered by IIT-BombayX is the LifeMOOC, targeted at lifelong learners, which are not as rigorous as the other courses, and of a shorter duration. In this way, IIT BombayX is catering to several subpopulations of lifelong learners that might benefit from MOOCs and is also leveraging its status as one of the premier institutions in the country to help increase the overall level of teaching and learning in India[8].

2.6.5 SWAYAM

In early September 2014, the SWAYAM MOOC platform was announced, as a partnership between the Government run IITs as well as several national level colleges. SWAYAM would deliver courses created by several elite Indian universities, also offered in regional languages to cater for learners who do not speak English. There was considerable media hype surrounding the announcement of the platform (Verma, 2015), and while there were delays in its implementation, the SWAYAM platform was finally launched in 2017, and as of 2019, has over 2000 courses on their platform, from High School to Post-Graduate level courses. **Figure 2** shows the breakdown of course offerings on the SWAYAM platform as of April 2019[9].

Figure 2: Courses on the SWAYAM platform by study-level as of April 2019

PROGRAMME CATEGORIES	› SCHOOL (162)	› CERTIFICATE (137)	› DIPLOMA (41)
	› UNDERGRADUATE (1075)	› POST GRADUATE (703)	› D.EL.ED COURSE
	› ANNUAL REFRESHER PROGRAMME IN TEACHING (ARPIT)		
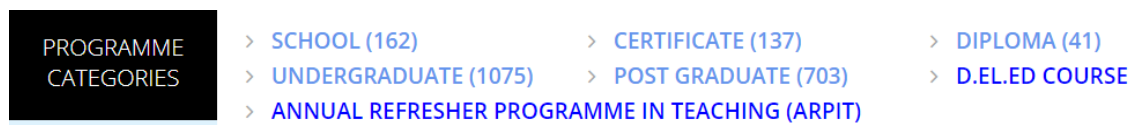
[8] Source: https://www.iitbombayx.in/ Retrieved May 20, 2019
[9] Source: https://swayam.gov.in/ Retrieved April 2, 2019

As a public-funded not for profit initiative, what differentiates SWAYAM from the rest of the MOOCs discussed in this section is that learners at participating colleges can award up to 20% of formal credit to students who complete MOOCs through SWAYAM (Chauhan, 2017). Through the 'Credit Framework for Online Learning Courses through SWAYAM' Regulations passed in 2016, the University Grants Commission (UGC) has instructed universities to "make amendments in their Ordinances, Rules, Regulations etc. to incorporate provisions for credit mobility and recognition for Seamless Integrations of Massive Open Online Courses (MOOCs) offered through the SWAYAM platform" (Kanjilal, 2016, p. 7). This framework allows learners at smaller institutions that may be lacking in resources and faculty, to use MOOCs from the larger universities in India, and have it count towards their formal degree. Recognising the challenges of delivering online courses to rural populations where internet connectivity may not be adequate to stream video lectures, the Indian government further launched the 'SWAYAM Prabha' program, a group of 32 free Direct to Home (DTH) TV channels which telecast video lectures from SWAYAM courses, similar to Open University courses that once were broadcast on television.

2.6.6 Summary

This section outlined some of the main developments around MOOCs in India, along with some of the unique ways in which MOOCs are being utilised, given the limited access to high-speed connectivity and the challenges facing Indian higher education. The early adopters of MOOCs in India were the larger institutions like the IITs and the IIMs, with faculties experimenting with indigenously designed platforms in the case of mooKIT, as well as through adapting the openedX platform in the case of IIT BombayX.

In the case of IIT BombayX, MOOCs are being leveraged in a flipped model, allowing instructors from smaller institutions to deliver courseware from IIT Bombay to their classes, while also contributing to the continuous professional development of instructors, by training them on how to best make use of MOOCs in a flipped-classroom model. Furthermore, the TESS-India MOOCs demonstrated the value in a cross-cultural delivery of a MOOC, with collaboration between local and Western partners.

Another critical factor that differentiates Indian MOOC developments over what has been witnessed in the West is that all of these projects are publicly funded, rather than through private equity. This means that these courses are created for the good of the public, and are less likely to be profit-driven enterprises. At the same time, it also means that there is quite limited funding available for the development of each course, compared with the greater amounts of funding available for courses in the West.

Lastly, the development of the SWAYAM platform and a national-level policy towards accreditation of MOOC certificates from the Indian government demonstrates a desire to incorporate MOOCs more formally into Indian Higher Education. As these developments are quite recent, there are not yet any studies that evaluate the extent of usage of these various endeavours, and is a potential avenue for future research.

2.7 Platforms for this study

This section will briefly outline the history and status of the two MOOC platforms that form the basis of the comparison of this study, namely NPTEL and FutureLearn.

2.7.1 NPTEL

As shown in the earlier section on MOOCs in India, the Indian Institutes of Technology (IITs) have been at the forefront of several Technology Enhanced Learning initiatives. After the emergence of the MIT Open CourseWare in the early 2000s, the IITs, in 2003, set up NPTEL - The National Programme on Technology Enhanced Learning. Initially a repository of all course materials from the IITs, NPTEL has been building their catalogue over the last decade, having around 860 courses and over 200 million page views (The Economic Times, 2015a). NPTEL actively encourages regional institutions to adapt their materials for their own courses, with all content being shared with a Creative Commons license[10]. In order to reach rural areas with limited connectivity, NPTEL allows institutions to download and store their entire catalogue of OERs locally, and for a nominal cost, learners can purchase DVDs with course content on them. In this way, NPTEL has accounted for some of the challenges of implementing large scale TEL projects in a country like India.

With the advent of MOOCs, NPTEL started providing certification for a few of its courses, by requiring learners to pay a modest fee of Rs. 1100 (approx. £10) and give a proctored examination at a regional centre. With the introduction of the SWAYAM platform in 2017, as discussed in **Section 2.6.5**, NPTEL courses were also offered for formal credit, under the umbrella of SWAYAM. As a publicly funded non-profit venture, this initiative has an incredibly low budget, and instead of adapting courseware for the MOOC format, these courses have, in most cases, made use of the existing NPTEL video lectures, often recorded during live lectures, with most videos being over thirty minutes in length. Contrary to the well-produced and designed MOOCs from platforms like edX and Coursera, these courses offer minimal to no support, with access to a Google Group for each course being the only form of communication learners have access to. Often, these groups are sparsely

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[10] See http://nptel.ac.in/faq.php#9 Retrieved 20 May, 2019

populated, with little to no discussion whatsoever, and consists mostly of students having specific queries with regards to the content (See **Figure 3**).

Figure 3: An example of a Discussion Forum on an NPTEL MOOC

Further, compared to the automated assessment models developed by global MOOCs, for many NPTEL courses, assessment is provided to learners each week, along with answer sheets that the learner would have to manually refer to in order to get feedback, instead of quizzes or other forms of adaptive automated assessment. In some cases, the solutions to the assessment are even hand-written. **Figure 4** shows the low-tech solutions to assessments in the first week of an NPTEL MOOC.

Figure 4: An Example of Assessment Solutions in an NPTEL MOOC

Through a study of the minutes of their planning committee meetings (NPTEL, 2014), there have been suggestions of reworking content into a familiar, learner-friendly MOOC format, however, there has been little to no progress on this front till date, and at the same time there has been a substantial increase in the number of courses being offered with certification through this method.

Unlike privately funded MOOC platforms, NPTEL is entirely funded through the Indian government, not just the platform, but also the creation and running of courses offered by all the various universities. This means that the budget that NPTEL has to work with is considerably lower than many Western MOOCs, and has necessitated such a frugal approach to MOOC delivery. These factors bring in to question the quality of teaching and learning that is being delivered through the NPTEL platform, and whether they constitute a MOOC. It further raises interest in understanding the experiences of the learners that take these courses, and what benefit do they see as a result of taking them.

2.7.2 FutureLearn

FutureLearn, a UK-based MOOC platform, was formed in part as a response to the rise and popularity of USA-based MOOC providers like Coursera, edX and Udacity (Shaw, 2012). Funded by The Open University, FutureLearn initially partnered with 11 other UK higher education institutions, and later expanded to include hundreds of partner universities across the world, as well as a number of cultural and historical institutions of repute, such as the British Council, the British Library, the British Museum, and the National Film and Television School[11].

Unlike its USA-based counterparts that were organised around theories of instruction, the FutureLearn platform was designed around the learner-centered social-constructivist pedagogy, based on the Conversational Framework (Ferguson & Sharples, 2014) which was defined as "a general theory of effective learning through conversations, with oneself and others, about the immediate world and about abstract concepts. To engage in successful conversations, all parties need access to a shared representation of the subject matter as

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[11] Source: https://www.futurelearn.com/about-futurelearn Retrieved 2 April, 2019

well as tools for commenting, responding and reflecting" (ibid., p. 5). This emphasis on the social made FutureLearn stand out from other MOOC providers, with each course divided into a series of learning elements called *Steps*, which could take the form of a piece of content, assessment or discussion, and which each had an embedded section for learner conversation. **Figure 5** shows a typical step on a FutureLearn course.

Figure 5: A typical 'Step' on a FutureLearn MOOC

In terms of the design, scale, and pedagogy, FutureLearn and NPTEL could not be further apart from one another. This makes the comparison of the demographics, motivations and experiences of their learners all the more interesting to explore.

2.8 Chapter Summary

This chapter introduced the reader to the context of this study. The history, as well as the current state of MOOCs, was introduced to provide the reader with a brief, yet foundational understanding of the various circumstances that have led to of the development of MOOCs more generally, as well as the different ways in which MOOCs have been engaged within the Global South more specifically. Next, this chapter provided the reader insight into Indian higher education, as well as the various challenges that currently beset it. This provided context to the numerous MOOC initiatives that have been developed in India, as well as some of the more creative ways in which MOOCs have been delivered in India with a focus on the disadvantaged learner. The chapter discussed SWAYAM, an initiative by the Indian government to incorporate MOOCs into formal higher education across India, and lastly introduced the reader to the two platforms being compared in this study, NPTEL, and FutureLearn. Now that the context for this study is established, the following chapter reviews the literature around the three main themes of this study, namely, demographics, motivation and experiences.

Chapter 3: Literature Review

This chapter includes a review of the literature on the three key themes this research study was interested in. **Section 3.1** reviews the literature on Learner Demographics in MOOCs, **Section 3.2** reviews the literature on Learner Motivation in MOOCs, **Section 3.3** reviews the literature on Learner Experiences in MOOCs, and **Section 3.4** discusses the literature around MOOCs as neo-colonialism.

3.1 MOOC Learner Demographics

Despite the early promise of MOOCs to 'democratise education' (A. Agarwal, 2013; Koller, 2012), studies on MOOC learner demographics are revealing time and time again that MOOC learners tend to be already educated, likely to be employed, and mostly from developed nations (Deboer, Seaton, & Breslow, 2013; Zhenghao et al., 2015). One study found that learner cohorts from BRICS (Brazil, Russia, India, China, South Africa) and other developing countries had a higher gender skew towards male learners, than did Western learner cohorts (Christensen et al., 2013), with India, in particular, having one of the widest male to female ratios on the Coursera platform - 76% male to 24% female (Coursera, 2016b). After analysing survey results from 38 Coursera MOOCs by the University of Pennsylvania, Christensen at al (2013, p. 6) critiqued some of the hyperbolic statements around MOOCs, suggesting "despite the optimistic and aspirational declarations of many MOOC providers, these courses are not, as of yet, making education 'borderless, gender-blind, race-blind, class-blind, and bank account-blind'".

By the nature of their open entry, MOOCs typically attract a diverse range of learners from across the world. Understanding the demographics of MOOC learners has been of particular interest to researchers, especially within the educational data-mining and learning analytics communities, aiming to correlate patterns of behaviour within MOOCs with various demographical factors to help predict learner success in MOOCs (Halawa et al., 2014; Y. Wang, Baker, & Paquette, 2017; Zhenghao et al., 2015). This section outlines some of the main findings of studies done on the demographics of learners across MOOCs, focusing on Nationality and Culture in **Section 3.1.1**, Gender in **Section 3.1.2**, Age in **Section 3.1.3**, and Education Level and Employment Status in **Section 3.1.4**.

3.1.1 Culture, Nationality and Language

In order to get a sense of the unique factors that might influence the experiences of learners from India, it is essential to first and foremost understand the role that nationality, culture and language play in online learning environments generally, and MOOCs more specifically. Close to 40% of all enrolments in MOOCs have been found to be from learners from less-developed countries (Kizilcec, Saltarelli, Reich, & Cohen, 2017), while the majority of courses, especially on Western-based platforms, are from Western universities. With English being the language used to deliver courses on the major MOOC platforms, there is a need to investigate the effects language also plays in determining the demographics of the learners, especially from the Global South.

Culture has been defined in the *Merriam-Webster Dictionary* as "the customary beliefs, social forms, and material traits of a racial, religious, or social group". While there are nuanced interpretations of culture in the academic discourses around cultural studies, this study takes the pragmatic perspective, using the anthropological definition of culture as "a way of talking about collective identities." (Kuper, 2009, p. 3) when discussing Indian culture. India does not possess a monolithic culture, but rather a vibrant diversity in its languages, ethnicities, religions, castes and tribes that vary from region to region (Bhattacharyya, 2003, p. 148). There has been considerable debate as to what constitutes Indian culture (Bhargava, Bagchi, & Sudarshan, 1999), with cultural pluralism challenging notions of citizenship and tolerance among the different communities that constitute Indian society (Mahajan, 2002). However, analysing Indian MOOC learners through the nuances of the multi-ethnic, pluralistic nature of Indian society is beyond the scope of this study, and not its intended purpose. Hence, this thesis acknowledges the limitations of the usage of the term culture in reference to India but refers to Indian culture more generally as the collective identity of the people of India.

The nationality of a learner on a MOOC has been shown to play a significant role in their motivations, performance, and experiences on a course. As countries become more developed, learners from those countries have a higher completion rate in MOOCs (Kizilcec et al., 2017), as demonstrated by **Figure 6**. At the same time, another study found

that in a MOOC on Big Data, learners from developing countries were more likely to solve quizzes and spend lesser time on watching videos, while learners from developed nations balanced their time between the videos and the quizzes (Liu et al., 2016). This could be due to challenges with access to high-speed internet connectivity, which, as course content is mostly in video form, might be an exclusionary factor for many learners in the Global South who might be in a position to most benefit from MOOCs.

Figure 6: Completion Rate in MOOCs by country. Reproduced from Kizilcec et al., 2017
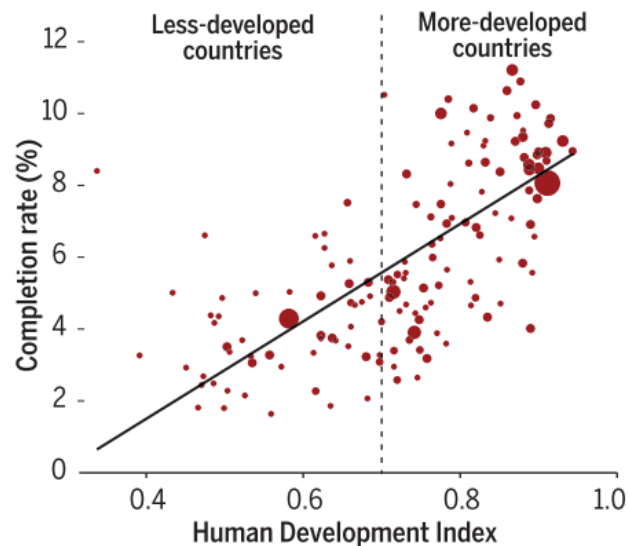
As most Western MOOC platforms deliver their courses in English, it is not surprising that learners from English-speaking countries account for the largest number of enrolments on these platforms (Bozkurt, Yazıcı, & Aydın, 2018). In a study of HarvardX MOOCs, six of the top 10 countries by learner origin were majority English-speaking, as well as the countries of Nigeria, India and Pakistan, all of which have significant English-speaking populations (Nesterko et al., 2013). English is still the dominant medium of instruction in higher education in India, and hence even the Indian MOOC platforms of NPTEL and SWAYAM have their courses delivered in English, albeit with regional language subtitles. That being said, currently, only around 12% of Indians speak English as an additional language [12], and

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this language barrier automatically excludes almost 90% of the population from learning through MOOCs. In a way, this furthers the divide between those with access to higher education and learning resources like MOOCs and those who could potentially gain the most from open education.

3.1.2 Gender

While online learning environments might seem on the surface to be able to break down traditional barriers and be a more democratic form of learning, however, there still exist challenges in bringing equality between the genders in these online learning environments; challenges that are amplified in the Global South.

MOOCs on average have been shown in several studies to be predominantly used by males (Bayeck, 2016; Ho et al., 2015), while individual courses that are not in STEM (Science Technology Engineering and Mathematics) domains have been shown to have a female majority (Shi & Cristea, 2018). Coursera, in a report in 2016, showed the gender split of their entire userbase to be 60% male to 40% female, with the difference being significantly smaller in Western countries like the US and the UK (Coursera, 2016b). A similar gender gap was found in a study of HarvardX MOOCs, with the gap appearing to be more prominent in developing countries, as evidenced by **Figure 7** (Nesterko et al., 2013).
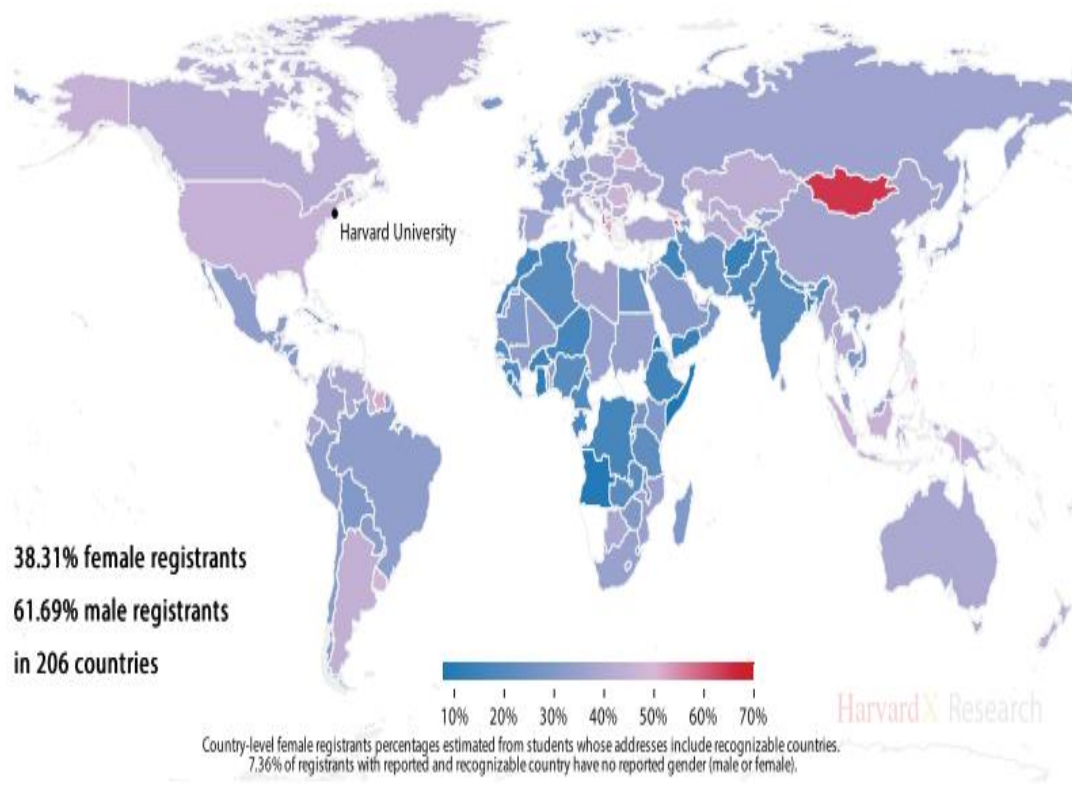
India had one of the worst gender-splits on Coursera, with 76% males to 24% females (Coursera, 2016b). FutureLearn, one of the two platforms in this study, was interestingly shown to have predominantly female learners, with 62% female learners across all their courses (Walton, 2016). This could, in part, be due to the pedagogical design behind the FutureLearn platform, and its emphasis on conversation and discussion amongst learners, as a study has shown that female learners were found to be more likely to engage with group work and other social activities, even in STEM MOOCs (Bayeck, 2016), which are traditionally considered to be male-dominated. This study was interested in identifying to what extent do these gender disparities affect FutureLearn and NPTEL in the Indian context.

3.1.3 Age

As diverse groups of learners generally take MOOCs, the age of participants seems to vary considerably, depending on the particular platform or discipline of the MOOC. A review of the scholarship on MOOCs found the vast majority of learners being between the ages of 20 and 40 (Ebben & Murphy, 2014, p. 338). Supporting these findings, a survey of over 50,000 Coursera participants showed a median age of 41, with a range of 31 to 55 years for the 25th and 75th percentiles respectively (Zhenghao et al., 2015), while a survey of a similar scale from Harvard and MIT found the median age on their MOOCs to be 29, with younger learners tending to take MOOCs in the Computer Science and Science, Technology, Engineering and Mathematics (STEM) disciplines, while the Humanities and Social Sciences tended to have slightly older participants (Ho et al., 2015, p. 24).

While focusing on the average ages of participants in MOOCs may help understand the main groups of learners that might be taking these courses, what could also be of interest is what occurs at the periphery. Liyanagunawardena and Williams (2016) studied the usage of MOOCs by the elderly, finding that on ten FutureLearn MOOCs by the University of Reading, the proportion of learners over the age of 56 varied considerably based on the relevance of the course to their needs. For instance, a course on "Heart Health" had close to 40% of pre-course survey respondents over the age of 56, compared to just 3% of respondents on the "Beginners guide to writing in English" MOOC (ibid., p.7). These findings suggest that there are a significant number of elderly learners interested in taking MOOCs, but only if the content is relevant to their specific needs. With most MOOCs aiming at a younger demographic, with a focus on skills development and credentialing, these groups of elderly learners are potentially being ignored. Liyanagunawardena and Williams (2016) go on to argue that while MOOCs could potentially play a role in dealing with the issue of loneliness among the elderly, the number of courses dedicated to issues around ageing is still very limited. This study explored to what extent do these different age groups of learners from India take MOOCs on FutureLearn and NPTEL, and how widespread is the usage of MOOCs amongst the elderly, or more mature learners in India.

3.1.4 Education Level and Employment Status

Early discussions around MOOCs and their potential often discussed the ability to help educate those that lacked access to education (A. Agarwal, 2013; Koller, 2012) - part of a broader narrative of MOOCs levelling the educational playing field.

However, numerous studies conducted on the educational and employment levels of learners have shown that MOOCs are more widely utilised by the already educated, in some form of formal education, or already in some form of employment. In a survey of over 50,000 Coursera users across all their courses, 83% had at least a bachelor's level degree, 58% were employed full-time, and 22% were full or part-time students in some form of formal education (Zhenghao et al., 2015). Another survey on an introductory level Computer Science course on edX had over 70% of its respondents with at least a Bachelor's degree, with close to 6% of respondents having a PhD in a science or engineering domain (Deboer, Seaton, et al., 2013). Similar results of an already educated demographic have been found in numerous other studies on MOOCs (Dillahunt, Wang, & Teasley, 2014; Ebben & Murphy, 2014; Emanuel, 2013; Veletsianos & Shepherdson, 2016; Zhenghao et al., 2015). As one study concludes, "MOOCs seem to be reinforcing the advantages of the 'haves' rather than educating the 'have-nots'. Better access to technology and improved basic education are needed worldwide before MOOCs can genuinely live up to their promise" (Emanuel, 2013, p. 342). Further, employment and higher levels of education have also been linked with greater participation and engagement with group work (Bayeck, 2016), and so these groups of learners have an even greater advantage when participating in MOOCs.

Figure 8: Overview of Employment rates of Respondents in various studies (Reproduced from van de Oudeweetering and Agirdag 2018, p. 6)

Article	% Employed	% Student	% Retired	% Unemployed	Industries of employment	Respondents
Alcorn et al. (2015)	72.1%	32.1%	*ns*	20.5%	ICT (22%) Business (14.6%) Management (7.9%)	148,955
Christensen et al. (2013)	69.3%	17.4%	6.8%	6.6%	*ns*	34,799
Greene et al. (2015)	68.0%	29.0%	*ns*	*ns*	*ns*	5,306
Liu et al. (2014)	84.0%	10.0%	1.0%	*ns*	*ns*	409
Liu et al. (2015)	83.0%	12.0%	*ns*	*ns*	Journalism (30%) ICT (18%) Education (10%) Business (7%)	320
Robinson et al. (2015)	74.9%	*ns*	3.8%	18.6%	ICT (32.8%) Education (14.2%) Business (7.5%) Management (4.3%)	7,551
Schmid et al. (2015)	57.3%	*ns*	*ns*	12.0%		27,939
Coursera's average	73.3%	*ns*	4.9%	18.0%	ICT (25.2%) Education (16.6%) Business (9.8%) Management (5.1%)	*ns*
Total	69.9%					225,279

Note. ns = not stated.

Figure 8 shows the levels of employment of learners across various studies on MOOC learner populations (van de Oudeweetering & Agirdag, 2018, p. 6). With an average employment rate of close to 70%, this could suggest that MOOCs are being used more to supplement workplace learning rather than as open tools for learning for disadvantaged communities that lack access to higher education or employment. This study explored to what extent these findings apply in the Indian context, across NPTEL and FutureLearn, as this could have potential implications about the role that MOOCs could have in India.

3.1.5 Summary

This section highlighted the literature on Learner Demographics in MOOCs, one of the three main themes of this study. It was shown how Culture, Nationality, and Language, all play a vital role in the potential success of a learner in a MOOC, with learners from countries in the Global South tending to perform more poorly, and were at a more considerable disadvantage in MOOCs than the average learner. Further, the literature also outlined that for the most part, MOOCs have a significantly higher proportion of male participants, and the gender ratio is worse in the Indian context. While most learners on MOOCs tended to be between the ages of 20-40, the discipline of the MOOC played a significant role in determining the age profiles of learners, with elderly participants being a significant proportion of the cohort in MOOCs related to ageing and health and wellness. Lastly, this section showed how several studies identified that MOOC learners overwhelmingly tend to be highly educated, and already employed, bringing into question the potential of MOOCs for development. After a review of the literature on MOOCs as a vehicle of social mobility, van de Oudeweetering and Agirdag (2018, p. 8) conclude:

> The literature substantiated that there are fewer barriers to MOOCs than to higher education. Still, the remaining barriers seem to hamper access for underprivileged populations specifically. Especially for individuals with little resources or in remote areas in developing countries, the necessity Internet access or additional expenses could obstruct their participation in MOOCs. Also, confusing indications about prerequisite knowledge could hamper the MOOC enrollment for those with little educational experience. Even though MOOCs require less financial investment or social and cultural proximity to higher education institutions, the results show that individuals with little financial resources or in less culturally or socially dominant contexts experience evident barriers towards MOOC participation.

3.2 MOOC Learner Motivation

> *Motivation is a dynamic state, and while an individual can bring to a MOOC a strong general motivation for learning that tends to remain stable over time, the MOOC context and content can alter or trigger changes in motivational states.* (de Barba et al., 2016, p. 219)

The second theme that this study explored is that of Learner Motivation in MOOCs. In order to better evaluate the role MOOCs currently fulfil, as well as the potential of MOOCs in the Indian context, it is crucial to understand the factors that motivate learners to sign on to courses, while also understanding the processes that keep learners motivated through the course. Learner motivation is a prominent field of research within formal and informal online and distance learning and is a crucial element that influences the persistence of learners in these more traditional forms of online learning (Hart, 2012). This section firstly defines and situates the term motivation, as used in this study, and then goes on to discuss the existing literature on learner motivation in MOOCs, considering factors that influence learners to take MOOCs, as well as factors that help learners persist in MOOCs.

3.2.1 Motivation

Before discussing motivation as it pertains to MOOC learners, it is useful to contextualise motivation, as discussed in broader academic discourse. Motivation is a critical component of the process of cognition which regulates "the direction of action by focusing attention and activity on value- and goal-relevant behaviour at the expense of other, nongoal-relevant actions." (Locke, 2000, p. 411). It is generally accepted that there are three aspects of human behaviour that influence motivation: the *choice* of a particular action, the ability to *persist* with that action, and the *effort* expended on the action (Dornyei, 2000, p. 520).

While the underlying processes that dictate motivation are multifaceted and complex, in general, motivation is classified as being either *intrinsic*, that is, performing a certain action because of an inherent interest or enjoyment, and *extrinsic*, which refers to performing actions for a separable end, either to for a reward or to avoid punishment (R. Ryan & Deci, 2000, p. 55). This being said, the type of motivation one might possess is constantly shifting, and is not necessarily bound exclusively to either of these two classifications (de

Barba et al., 2016). Psychologists have further devised several theories of motivation to try and explain the complexities of human behaviour. While an overview of every motivation theory is beyond the scope of this thesis, this section considers some of the key factors that affect motivation, particularly in educational contexts, as outlined by Pintrich (2003), before exploring studies that focus on learner motivation in MOOCs.

Social cognitive theories, such as Bandura's (1994) theory of self-efficacy, or the perception of one's own competence, has been used to better understand the motivations of learners. For instance, if learners expect to do well, they tend to try harder, persist longer and perform better (Pintrich, 2003, p. 671). Next are constructs such as Self-Determination theory or attributional theory; the notion that learners who believe they have personal control or autonomy over their learning and behaviour are likely to be more motivated than learners who feel they lack control of their learning (ibid. 673). Personal interest and intrinsic motivation has also been identified as a factor that has positive outcomes on cognitive engagement, learning, and higher levels of achievement (Eccles & Wigfield, 2002; Pintrich & De Groot, 1990). Similarly, achievement goal theory has been used to suggest that the learners' own perceptions of the meaning of success, and the particular goal oriented mindset of the learner contributes to their motivation and engagement with academic work (Wolters, 2004, p. 236).

Lastly, the perception of *value* also plays an important role in the motivation of learners. Eccles and Wigfield (2000) have shown that task value beliefs (whether a certain task is worth doing) predict *choice* behaviour, such as whether or not to enrol in a course, while expectancy beliefs, such as self-efficacy or competence perceptions, predict achievement once enrolled (Pintrich, 2003, p. 875). This study takes this dynamic nature of motivation into account when considering learner motivation in MOOCs, considering both factors that influence learners to choose to sign on to a MOOC, as well as factors that motivate learners to persist with MOOCs (state-level motivation) (de Barba et al., 2016, p. 219). The following sections outline the literature around these two forms of motivation as it pertains to MOOC learners.

3.2.2 Motivation to take MOOCs

Unlike formal higher education, where learner motivations are mainly homogenous and mostly related to extrinsic goals, MOOCs are characterised by the diversity of their learners, as **Section 3.1** on Learner Demographics discussed. It is therefore likely that these learners, coming from a wide range of contexts and prior educational backgrounds, would have a wide range of motivations for taking a MOOC.

Early MOOC researchers were interested in trying to identify why learners were signing up to these free courses, and to try and identify potential causes for the high drop-out rates that MOOCs consistently demonstrated. In one of the first large scale studies that looked at learner demographics and motivations, Christensen et al. (2013) surveyed approximately 35000 learners on the Coursera platform. They found that nearly half of the learners surveyed chose to take a MOOC just for curiosity or for fun, while only 43.9% reported taking MOOCs to gain skills for their job. Further, the study found significant differences in intentions based on the discipline of the course – for instance, humanities courses had nearly 75% respondents taking courses 'out of curiosity', and only 11.9% for skills development (Christensen et al., 2013, p. 5). This early finding suggested that many MOOC learners may not necessarily be taking these courses just for formal education or career-oriented reasons, but also for leisure and curiosity-based lifelong learning.

The diverse nature of MOOC learner motivations to take MOOCs has been made evident in a number of exploratory studies of individual MOOCs (Belanger & Thronton, 2013; Breslow et al., 2013; Deboer, Seaton, et al., 2013; Hew & Cheung, 2014; Ho et al., 2015; S. Zheng, Rosson, Shih, & Carroll, 2015). Learners have signed up for MOOCs to learn about a new subject, or to improve on prior knowledge of a subject (A. Agarwal, 2013; Breslow et al., 2013; Hew & Cheung, 2014), out of plain curiosity (Martin, 2012; Young, 2013), or for a personal challenge (Breslow et al., 2013). Some 'hard-core' MOOC learners desire to obtain as many certificates as possible (Young, 2013), while for others, credentials are of little importance (Fini, 2009; Kolowich, 2013).

Kizilcec and Schneider (2015) collected responses from learners on 14 MOOCs offered by Stanford University. By correlating their responses to the survey with their engagement on the MOOC platform, the authors found that learner intentions were a predictor of

behaviour in the MOOC and found a wide range of distinct motivational patterns among learners, based on the differences in the courses. Instead of proposing a top-down model for universal MOOC design, they go on to recommend that courses could be flexible to allow individual learners to choose how they engage with the course, and providing spaces for social interaction for those learners who are motivated by a more social learning experience (Kizilcec & Schneider, 2015, p. 18).

3.2.3 Motivation to persist in MOOCs

While the motivations to take MOOCs might be varied in nature and discipline-specific, understanding the factors that influence learners to persist in MOOCs has been an essential area of MOOC research. Self-efficacy, that is, the learner's "beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives." (Bandura, 1994, p. 71), is one of the key criteria that determine student success and persistence in traditional online and distance education (Hart, 2012, p. 34). It has also been noted that successful online learners are more intrinsically motivated than their on-campus counterparts (M. Hartnett, St. George, & Dron, 2011, p. 21). Similarly, high levels of learner motivation has been shown to be a strong predictor of success in MOOCs (de Barba et al., 2016) In order to try and make sense of learners' motivations through a MOOC, some researchers have used two related but unique concepts. The following section will briefly discuss the conceptual framework of Self-Directed Learning (SDL) and the learner trait of Self-Regulated Learning (SRL) and look at the usage of these frameworks within the MOOC literature in order to unpack learner motivations.

Self-Directed Learning (SDL) finds its roots in the early 1970s informal adult learning (andragogy) literature (Garrison, 2003), but has been used as a framework in numerous contexts, including medical education, nursing, business, formal learning, and distance and e-learning. Self-Directed Learning has been defined as "a process by which individuals take the initiative, with or without the assistance of others, in diagnosing their learning needs, formulating learning goals, identify human and material resources for learning, choosing and implement appropriate learning strategies, and evaluating learning outcomes" (Knowles, 1975, p. 18) – in essence, the ability of learners to learn on their own.

However, according to Garrison (1997), much of the interest surrounding Self-Directed Learning tends to focus on the 'autonomy' of the learner, rather than the deeper cognitive and motivational factors that play a crucial role in the learning process. According to Garrison (ibid.), there are three interconnected factors: Motivation, Self-Management and Self-Monitoring, which together form a comprehensive model of Self-Directed Learning.

The construct of motivation here is broken down into *entering* motivation – the motivation needed to decide to participate (enter) into learning (As discussed in the previous Section), and *task* motivation – the motivation needed to stay on task (Garrison, 1997, p. 27). Self-Management deals with the *control* aspects of learning – and is closely associated with the trait of Self-Regulated Learning. While self-directed learners are autonomous, according to Garrison (ibid.), they are not independent and require guidance from within the learning context. Self-Monitoring refers to the metacognitive processes in which the learner "takes responsibility for the construction of personal meaning" (Garrison, 1997, p. 24) by observing, judging, and reacting to their learning processes. Song and Hill (2007) critique Garrison's model, particularly its lack of explicit mention of the impact of the learning context and its interaction with the framework. They go on to suggest a more robust framework (**See Figure 9** on the following page), particularly with respect to online learning, which provides learners with a significantly greater amount of autonomy and control. This framework takes the learning context into account, along with its interplay with the personal attributes of learners and the various learning processes. They argue that the learning context "not only impacts the way learners plan, monitor, and evaluate their learning (process), but it has the potential to influence how a learner becomes motivated to learn, and how he or she uses various resources and strategies to accomplish learning in the specific learning context." (Song & Hill, 2007, p. 33). As the Indian context has considerable differences to the Western contexts that have been the focus of most research on MOOC learner behaviour, this study was interested in discovering in what ways do learners from India use the same SDL strategies, if at all, to motivate them in a MOOC.

Self-Directed Learning, with its emphasis on learner autonomy, self-monitoring and self-management, has been used as a useful framework within the distance learning literature and has been used in several formal and informal contexts. In experiments at a vocational

institution in Spain, learners, who were typically busy professionals, were provided counselling to improve their metacognition and given guidance to become self-directed learners. The study found that learners who chose to become self-directed improved in all measured parameters, including motivation and self-esteem (Victori & Lockhart, 1995), but also found that a few participants attempted to change their learning habits as per the counselling, but failed and reverted to their previous methods. Nevertheless, this suggests that guidance and counselling can provide meaningful improvements in learner metacognition, particularly with non-traditional learners. It is unlikely that such counselling resources would be available in traditional MOOC settings, especially within a Global South context, but suggests one potential avenue to increase learner motivation and raise completion rates.

Figure 9: A Conceptual Model for Understanding Self-Directed Learning. Reproduced from Song and Hill (2007, p.31)
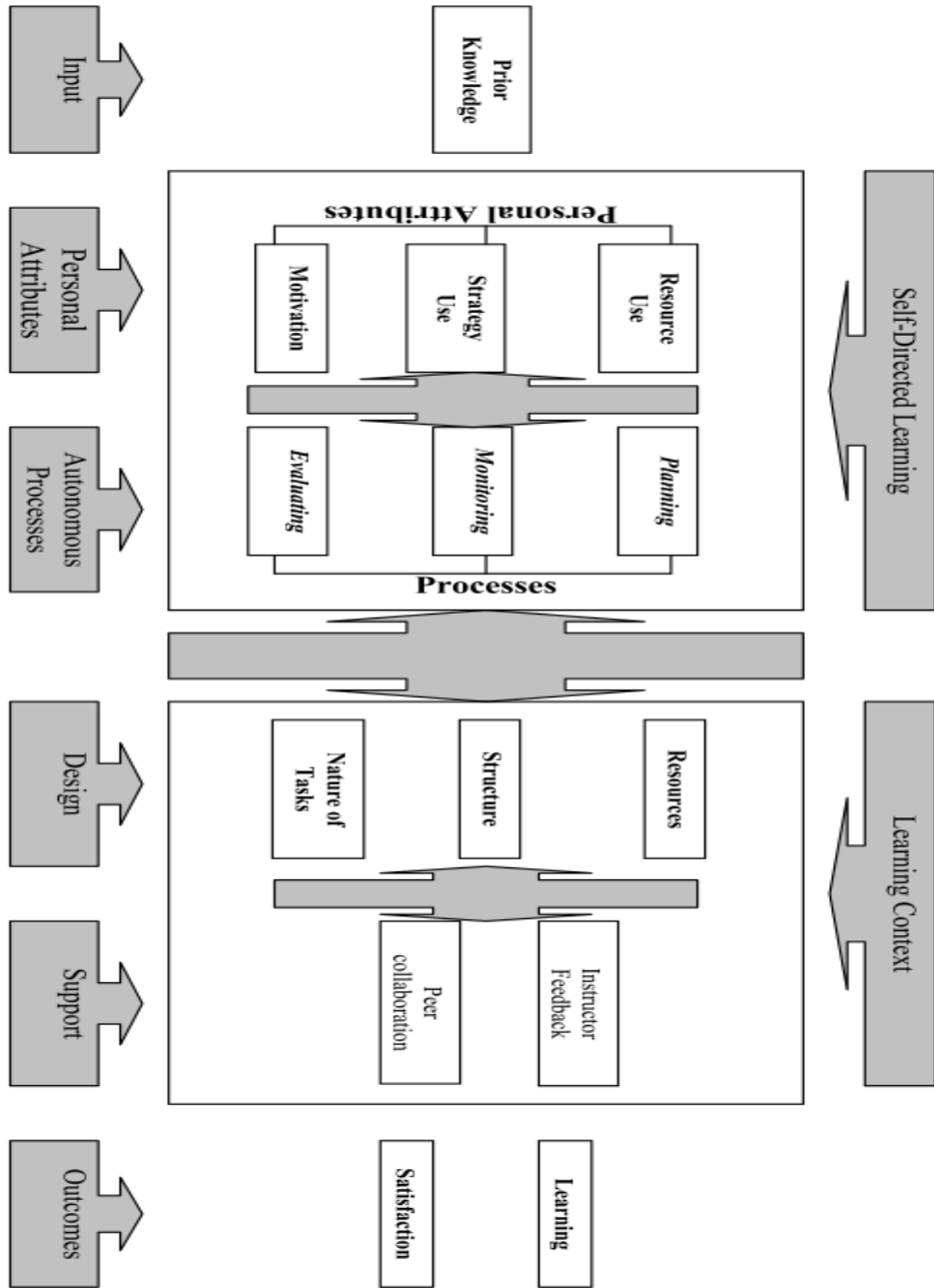
Within the MOOC literature, Self-Directed Learning has played a particularly important role in explaining learner motivations and persistence within connectivist MOOCs (Kop & Fournier, 2010; Mackness et al., 2010), where the emphasis is not on the access to learning resources, but rather in the ability to nurture and facilitate communities of self-directed learners (Ross, Sinclair, Knox, Bayne, & Macleod, 2014). Meanwhile, as de Waard et al. (2015) argue, "if learners are allowed to dip-in and out of MOOC, if their self-efficacy allows them to choose what they need from a MOOC, and generally adapt or direct their learning in order to achieve personal learning success, then SDL is used and reached no matter which type of MOOC". In their study on early FutureLearn courses, de Waard et al. (2015) used a phenomenological approach to unpack learners' experiences, finding that even within the xMOOC platform, some learners use Self-Directed Learning strategies as part of their learning processes. In another small-scale ethnographic study of a single MOOC, participants "tended to equate MOOC *success* with personal knowledge gain and enjoyment and MOOC *completion* with both personal satisfaction and course requirement fulfilment." (Loizzo, Ertmer, Watson, & Watson, 2017).

This inherent disconnect between learner defined success and the restrictive definitions of completion being bound by specific assessment tasks as set out by the MOOC designer leads to challenges for learners whose motivation is predicated on SDL goals. This might, in part, explain the low completion rates of MOOCs. While completion may be defined through a specific set of rubrics and measurements, for the learner, the definition of having 'completed' a MOOC may be when they have achieved the targets they set for themselves of what they wished to learn from a course. Studies that have considered the SDL framework for MOOC motivation tend to have a small sample size, and generally focus on a singular MOOC. Further research is required to unpack the use of self-directed learning by MOOC learners, and to what extent, if any, does their use of these strategies impact their learning experiences, and their satisfaction with having reached their self-assigned goals from a MOOC. More importantly, while SDL strategies may be employed by a few active and motivated learners, to what extent are these strategies prevalent in the MOOC cohort, and how could these strategies be taught to the broader MOOC learner population, has yet to be explored.

Similar to the notion of Self-Directed Learning is that of Self-Regulated Learning (SRL), defined broadly as the ability of learners to become active agents in their own learning processes – metacognitively, motivationally and behaviourally (Zimmerman, 1989, p. 329). SRL and SDL are similar in that they both emphasise the intrinsic motivation of the learner, involve active engagement and goal-directed behaviour, and both promote the development of metacognitive skills of the learner. A key point of difference between the two is that SDL is considered a more holistic approach to learning, involving both learner characteristics as well as the learning context, while SRL is usually just described as a desirable learner characteristic (Loyens, Magda, & Rikers, 2008, p. 418).

Given the free and open-entry feature, coupled with low levels of support and guidance typically associated with MOOCs, SRL skills are crucial for learners (Kizilcec, Pérez-Sanagustín, & Maldonado, 2016). In fact, procrastination and low levels of SRL has a significant negative effect on a learners' persistence in both traditional distance education (Sun & Rueda, 2012), as well as MOOCs (Diver & Martinez, 2015; Shapiro et al., 2017). A survey conducted on close to 800 learners on a data science MOOC found that those "who were working as data professionals and/or studying towards a HE qualification appeared more highly self- regulated, exhibiting significantly higher SRL scores than those learners who were not working as data professionals or studying for a HE qualification" (Hood, Littlejohn, & Milligan, 2015). These findings suggest that learner self-regulation varies considerably based on the context of the learner. In follow-up interviews (Littlejohn et al., 2016) found that there were marked differences in motivations, goal setting and behaviour between learners with high SRL scores and low SRL scores. Those with high SRL scores tended to be non-formal learners using the MOOC for professional development purposes – mainly to make practical use of knowledge within their workplace, while those with lower SRL scores tended to be more interested in completing MOOC related activities and being awarded a certificate – treating MOOC learning as a formal activity (ibid., p.46). While these findings were based on a subpopulation of learners (data professionals) in a single instance of a MOOC, it nevertheless shows that SRL can explain some of the variances in learner behaviour in a MOOC.

Within formal settings, both SDL and SRL are seen as 'developmental processes' (Loyens et al., 2008, p. 423) - learner characteristics that improve throughout the duration of the degree. Within MOOCs, this could suggest that both SDL and SRL traits are positively correlated with how experienced learners are with open online learning. This is an area yet to be explored by the literature and could provide useful insight to course developers to better cater to a diverse range of learners.

3.2.4 Summary

This section outlined the literature surrounding the second theme related to the research questions of this study, learner motivations in MOOCs. The term motivation, in this study, referred to both, factors that influence learners to take MOOCs, as well as factors that influence learners to persist in MOOCs. Studies identified various factors that bring learners to MOOCs, intrinsic factors such as curiosity, personal challenges and to improve on prior knowledge about a subject area, as well as extrinsic factors, such as improving employment and educational prospects. The literature showed that these motivations were not uniform and did vary considerably based on the discipline or purpose of the particular MOOC.

Next, this section outlined the framework of Self-Directed-Learning (SDL) and the learner trait of Self-Regulated Learning (SRL). Both of these concepts are similar, in that they emphasise learner autonomy and metacognitive presence. Studies have shown that learners that demonstrated high levels of both these traits tended to have greater persistence in MOOCs, while suggesting that that persistence, measured through the completion metrics of the platform, may not be the most accurate measure of success for learners, particularly if they tend to be Self-Directed and are able to identify their own learning goals.

While these varied motivations for enrolling in MOOCs, and their potential to influence behaviour and persistence in MOOCs, has been well documented in the literature as outlined above, this study was interested in discovering to what extent are these factors applicable in the Indian context. Moreover, as motivations to take MOOCs tend to differ considerably based on discipline, this study was also interested in finding out to what extent, if at all, do these motivations vary based on platform, with NPTEL being a largely

STEM-based platform, and with FutureLearn having a more extensive range of courses on offer across a range of disciplines. Lastly, how useful are the constructs of SDL and SRL when considering the Indian MOOC learner, are all questions that this study was interested in exploring.

3.3 MOOC Learner Experiences

The third central theme this research study was interested in were the experiences of Indian learners in MOOCs. Within research into distance and online learning, historically there has been an emphasis on the evaluation of a particular piece of software or technology, or on the practitioners' perspective of their use of the new form of teaching and learning (Creanor, Gowan, Howells, & Trinder, 2006). This focus on the evaluation of technology often side-lines the learner perspective. With newer forms of technology-enhanced learning that continue to evolve over time, there is a need to involve the learner perspective during the development, design as well as evaluation of appropriate policy and strategy around these new technologies (Conole, 2008). According to Walker and Logan (2008, p. 5), research into the learner's voice "is about empowering learners by providing appropriate ways of listening to their concerns, interests and needs in order to develop educational experiences better suited to those individuals". Hence, in the context of this study, the 'learner experience' is defined as the subjective perceptions of learners about their attitudes, behaviours, concerns and evaluation of their process of learning in a specific context, which for this study is MOOCs.

With the amounts of data being collected from learners in a MOOC platform, there has been a desire to correlate learner behaviour, engagement and success in a MOOC with demographics or self-reported characteristics of learners, in order to identify characteristics or features that are able to predict learner success or persistence with a course (de Barba et al., 2016; Jung & Lee, 2018; Roy, Bouchoucha, & Anderson, 2014; Whitehill, Mohan, Seaton, Rosen, & Tingley, 2017). This view, however, could be considered to be limited, as Veletsianos and Shepherdson (2016, p.214), in their systematic analysis of the various methods used in empirical MOOC research, found "Very few studies were informed by methods traditionally associated with qualitative research approaches (e.g., interviews, observations, and focus groups). Thus, even though results suggest that

research on MOOCs focuses on student-related topics, learners' voices were largely absent in the literature.". This comparative lack of qualitative research into the learner perspective of taking a MOOC could be preventing researchers, practitioners, and other stakeholders from developing a holistic understanding of the diverse nature of participants and their experiences with MOOCs, something this project, in particular, was interested in studying.

With that being said, a few studies have used a variety of methods to attempt to understand the learner experience in MOOCs. Early cMOOC studies employed a wide range of qualitative and mixed methods approaches in unpacking the learner experience, however, the emergence of xMOOCs has led to an increase in the use of more quantitative analyses of learner behaviour based on the vast amounts of activity log data generally collected during a MOOC (Veletsianos et al., 2015, p. 572). As there are significant differences in the forms of learning taking place in cMOOCs and xMOOCs, this section will discuss the literature on learner experience in separate sections, before synthesising the findings and its application to this study.

3.3.1 Learner Experience in Connectivist MOOCs

With connectivist MOOCs finding origin within the education research community, research on this new form of learning began with a study on the very first MOOC – Connectivism and Connective Knowledge 2008 (Mackness et al., 2010). In fact, a literature review of MOOC studies between 2008-2012, before much xMOOC research was published, found that a majority of the early research on MOOCs focused on the learner perspectives, mainly through case studies of specific cMOOCs, using surveys and focus groups as their primary methods of data collection (Liyanagunawardena, Adams, & Williams, 2013). This is not surprising, as the focus of the cMOOC is on the learner and their networks rather than the xMOOC focus on content and assessment.

Within a cMOOC, four activities are considered as critical aspects of the learning experience: "aggregation (sometimes referred to as curation, accomplished through an initial list of resources on the MOOC website and then added to through a daily newsletter sent to all participants); remixing (where the connections are made and documented through blogging, social bookmarking, or tweeting); repurposing (often referred to as constructivism, in which learners then create their own internal connections); and feeding

forward (that is, sharing new connections with others)." (Yeager et al., 2013, p. 134). As these tasks are often at odds with a traditional lecture-based transmission model of learning, it is no surprise that a recurring theme that emerged in studies of cMOOCs was that learners often feel overwhelmed by the amount of content typically available (Anderson & Dron, 2011; Kop, 2011; Kop, Fournier, & Mak, 2011). This suggests some form of curation or 'light touch moderation' (Mackness et al., 2010, p. 272) might be needed from the instructors to ease the cognitive load that learners might experience when they take the MOOC.

A fundamental tenet of connectivist pedagogy is that learning occurs through active participation within the network (Siemens, 2004). However, multiple studies have found that even in cMOOCs only a minority of participants actively contributed to the network (Kop, 2011; Milligan et al., 2013), suggesting that active participation may not necessarily be a measure of learning and that learners who are not part of the immediate network of active learners might feel alienated. Similarly, a study on Stanford University xMOOCs found that over 90% of all forum activity were *lurkers* (Stanford University, 2013) and forms of 'vicarious interaction' (Sutton, 2000), where learners who observe and process interactions of other learners in online spaces still gain the benefits of active interaction, might explain some of the differing experiences of learners in MOOCs.

Most early research on cMOOC learner experiences stressed the need for self-directed learning strategies in order to overcome some of the challenges of this form of distributed pedagogy (Veletsianos et al., 2015). The xMOOC environment is comparatively less chaotic, usually with a clear structure and weekly progression that can be easily tracked by the learner. While the study outlined in this thesis involved a comparison of two xMOOC platforms, this study was also interested in understanding to what extent, if at all, learners from India are able to perform some of these metacognitive tasks outlined in the cMOOC literature, or if they tended to be more passive consumers of the mostly video-based content. These early studies laid the foundation of our understanding of learning at a massive scale and brought to the fore some pertinent issues that are relevant to discussions of xMOOCs as well, which will be discussed in the next section.

3.3.2 Learner Experiences in xMOOCs

Compared to the focus on the learner perspective in Connectivist MOOC literature, a report on the state of MOOC research in 2013 found that while there are a few existing accounts of learner experiences in xMOOCs, they either take the form of statistical analysis of course engagement, or individual anecdotal accounts (Haggard, 2013). Another review of research from 2015 identified that MOOC literature with a learner's perspective is still considerably lacking (Veletsianos et al., 2015), with most studies exploring a single case study, instead of attempting to identify commonalities and patterns across platforms or disciplines. This section will explore the varied ways in which researchers have unpacked the learner experience in MOOCs, while highlighting the literature on social learning

3.3.2.1 Classifications of Learners

As outlined in the earlier section on learner motivation (**Section 3.2**), successful learners on MOOCs are Self-Directed-Learners, who are able to define their own goals of what they wish to achieve from a MOOC, and strive to complete those specific tasks, not necessarily bound by the structure of the course itself. These strategies of how to experience MOOCs are likely in conflict with how MOOC providers see 'completion', and many researchers have attempted to classify and group learners, not based learners' intentions, but based on their activity on the MOOC.

Researchers have used student surveys (Milligan et al., 2013) and learning analytics (Clow, 2013; Kizilcec et al., 2013) to devise a classification of learners based on their patterns of engagement or their intentions and motivations in taking a MOOC. Clow (2013) borrows from marketing research and proposes a 'funnel of participation' in MOOCs, suggesting that most potential learners on MOOCs are either not aware, or are aware but do not register to the course. While the terminology used by most MOOC learner classification varies, these studies broadly identify similar patterns as proposed by (Hill, 2013) **as No-Shows, Observers, Drop-Ins, Passive Participants and Active Participants**. **Figure 10**, from Honeychurch et al. (2017, p. 195) highlights the levels of learner participation across a series of dimensions that goes beyond the simplified classification as outlined by Hill (2013). It is important to stress at this point that these classifications of learners are not set

in stone and are relatively fluid, and participants can easily transition from one such group to another over the course of the MOOC

Figure 10: Learners' participation levels and their position in layers of a learning network. Reproduced from Honeychurch et al. (2017, p. 195)
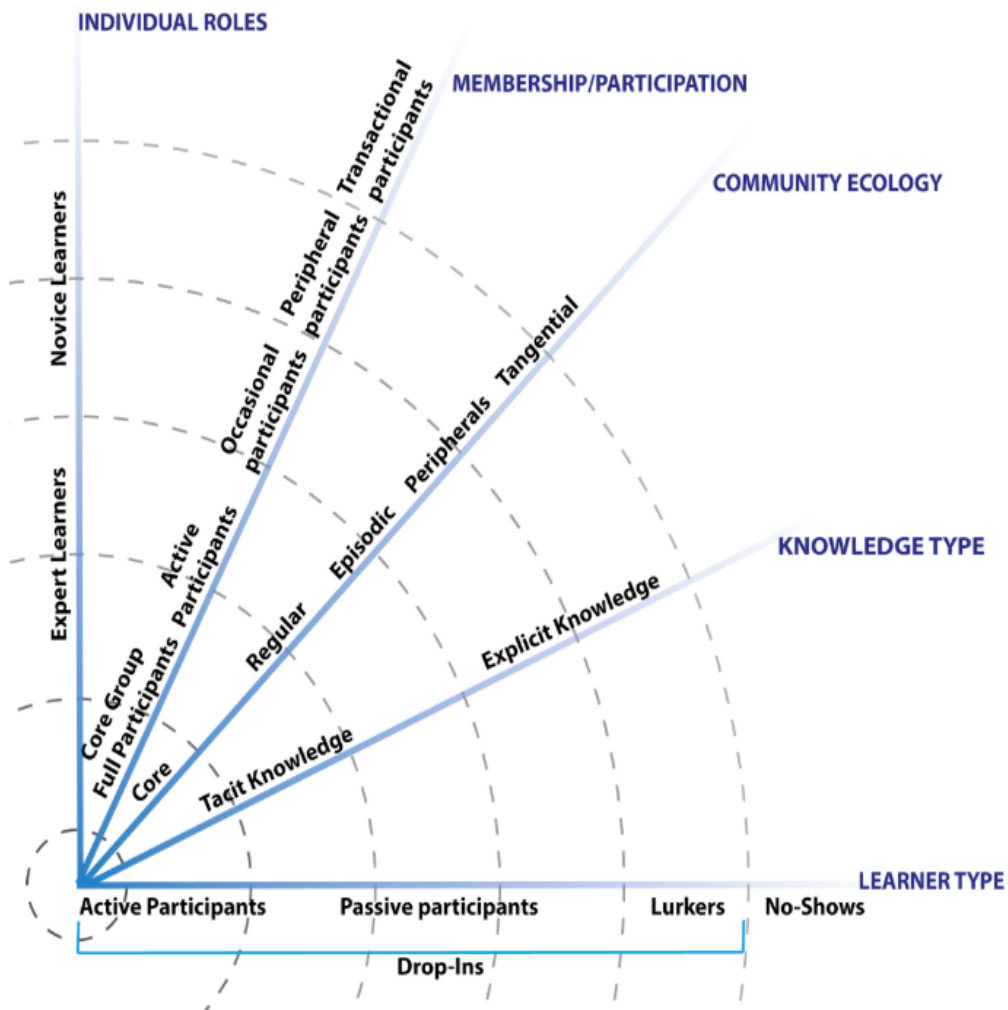
The *No-Shows*, learners who sign up to a course but never visit the platform after signing up, account for almost half of the total enrolments (Breslow et al., 2013; Kizilcec et al., 2013). These learners demonstrate an interest in the subject of the MOOC, and their intention to want to take the MOOC, but for whatever reason fail to return to the platform and start the course once the MOOC begins. As MOOCs are free to sign up for, it is understandable that these courses would attract a broad range of interested people who may not be committed to the course in any way. While these no-shows add to the number of registered

learners on a MOOC, they are also responsible for lowering the completion rates of MOOCs.

Drop-ins, on the other hand, are similar to the learners as described in **Section 3.2.2**, who are able to identify sections of the MOOC that are most relevant to their unique needs, and 'drop-in' to receive that specific bit of learning that they require. By the platform's metrics of completion, these learners are otherwise considered dropouts; however, by their own Self-Directed motivations and objectives, they have completed the bit of learning they were after and should be considered to have succeeded in the MOOC. Of the four categories of learners here, Drop-ins are the most flexible, as they can drop-in as active participants, passive participants, or observers.

Observers, also known as silent learners, browsers, vicarious learners (Honeychurch et al., 2017), amongst other titles, are learners who are part of the MOOC but do not engage with any of the course material beyond a cursory level. There may be a number of factors these learners choose to remain Observers, including "online community factors (group identity, pro-sharing norms, reciprocity, and reputation), individual factors (personal characteristics, self-efficacy, goals, desires and needs), commitment factors (affective commitment, normative commitment, and continuance commitment), and quality requirement factors (usability, security, privacy, convenience, and reliability)" (Honeychurch et al., 2017, p. 196). That being said, the behaviour typically associated with lurkers in online learning environments may not necessarily just be limited to the 'Observers'.

Active participants are those who fully commit to the MOOC, watching all the content and completing a majority of assignments. These learners, too, experience MOOCs in typically isolated ways. Studies have found that these active participants may not necessarily engage in social interaction with other learners, with one study finding that only one in five learners who scored over 90% in a course posted on the forums (Stanford University, 2013). The social aspect of the learning experience of a MOOC will be discussed in **Section 3.3.2.2**, which will explore the reasons why most learners, including those that score highly in the course, tend to avoid the MOOC discussion space.

Different platforms measure 'Active' learners using differing metrics. In the case of FutureLearn, a "Fully Participated" learner is one who has completed at least 50% of *steps* and has attempted all course tests, while a "Social Learner" is one who has posted at least one comment or replies at any point in the course. This study explored to what extent do these classifications apply to Indian learners, whether they are merely passive consumers of content or more active with their learning; whether they are 'completers', aiming to finish the MOOC in its entirety, or are they able to identify content relevant to their needs, and take out of the MOOC what they want, not necessarily bound by the MOOC providers' notions of completion. Further, this study also explored how the demographic and platform design differences between the two platforms of NPTEL and FutureLearn impact the potential patterns of engagement with the MOOC.

3.3.2.2 Social Learning in MOOCs

This study was also interested in identifying to what extent are Indian learners socially active in MOOCs, and how much do they value social interaction as part of their broader MOOC experience. This is especially important in the case of FutureLearn, whose platform was built using a social constructivist pedagogy that allows learners to engage in 'Social Learning' (Ferguson & Sharples, 2014), even though findings like those highlighted in the study in the previous section (Stanford University, 2013) could indicate that for the most part, the MOOC learning experience is an isolated one.

However, a few studies suggest that despite these low numbers of active social participation, there is a strong relation between active social interaction and persistence in MOOCs (Kizilcec et al., 2013; Sunar, White, Abdullah, & Davis, 2017). One study found that the pass rate for posters on the discussion forums was 68% compared to only 11% of non-social learners that nevertheless completed all assessment activities (Tseng, Tsao, Yu, Chan, & Lai, 2016). Efforts have been made by researchers to further categorise learners based on their social behaviour in MOOCs, in order to better understand the dynamics of discussions that take place on course forums, and to help MOOC providers better design their courses to foster more discussions within their courses.

Chua et al. (2017) categorized discussions on FutureLearn MOOCs into five distinct categories: "*initiating posts* that receive replies, *lone posts* that receive no replies, *replies* to

others' initiating post, *responses* to others' replies to one's own initiating posts, and *further replies* when one replies again to an initiating post". FutureLearn follows a unique design, as discussed in **Section 2.7.2**, whereby each 'Step' of the MOOC has an associated space for discussion. Chua et al. (2017)'s study found that, interestingly, *Steps* that were explicitly marked for Discussion elicited the most *lone posts*, that is, posts that had no responses, compared to *Steps* that discussed a particular concept, or which had a shared topic or opinion that naturally allowed for discussion. This finding could suggest that instead of generating prompts that would elicit individual replies from learners, which may never be read or commented on by others, MOOC designers could create greater opportunities for dialogue within the *step* itself. While FutureLearn allows learners to 'follow' other learners, and get alerted when one of their followed colleagues makes a post, even among the active forum users, 70% do not follow anyone (Sunar et al., 2017). Considering MOOC cohorts are, in essence, a group of strangers from diverse backgrounds that are temporarily sharing the same learning resource, it is no surprise that there is apprehension, even from the active participants, to follow and befriend other learners on MOOC platforms, and there may only be a small minority of 'super users' with specific personality traits that might actually make an effort to reach out to and make connections with other fellow learners on a MOOC. There also may be cultural differences that impact their attitudes on befriending fellow learners in MOOCs. The study in this thesis asked learners how much they valued social interaction with other learners, to find out to what extent is this form of cross-cultural networking an aspect of the Indian MOOC learning experience, particularly on the FutureLearn platform.

There is also the issue of the quality of discussion occurring on a MOOC. One study found that "over half of the discussions in both courses moved beyond sharing information and statements of agreement and entered a process of dissonance, negotiation and co-construction of knowledge, but seldom moved beyond this phase in which new knowledge was tested or applied." (Kellogg, Booth, & Oliver, 2014), with another study finding that a significant number of discussions that took place on MOOC forums were off-topic and not directly related to the course (X. Wang, Wen, & Rosé, 2016). These findings suggest that MOOC designers should consider carefully scaffolding discussion prompts within their

course content, in order to generate more on-topic discussion that can promote higher-order thinking and discussion between learners.

Social interaction, though, does not necessarily need to take the form of discussions within the platform. Veletsianos et al. (2015)'s study on learner experiences found that some learners might interact in social networks outside of the MOOC platform, both virtual, as well as face-to-face. Facebook and Google+ groups form an avenue for learners to discuss the MOOC in a more laid-back familiar setting. Meetups have been organised for learners to interact in person with each other, and some MOOC instructors have had *Office Hours*, both online and in-person, to try and bring learners together, and create a more social atmosphere within the cohort (Sanzgiri, 2013). Within the MOOC platform too, there have existed a number of *super-posters*, that have built an active community during the course, even though they may be few in numbers (Clinnin, 2014), and some have formed co-located study groups to take the course content together and discuss content face-to-face (N. Li et al., 2014).

Therefore, while clickstream data might suggest that MOOC learners are more interested in content than social interaction, the studies are limited in that they are unable to explore the social engagement of learners outside the platform, or they fail to take into account forms of vicarious engagement (Chua et al., 2017) of learners. This study, with its mixed-methods approach, aimed to connect some of these findings from the literature with the responses to the survey instrument delivered in Phase 2 of this study, and then to mix it with in-depth qualitative insight into the learner experiences in the Indian context through interviews in Phase 3. Moreover, as FutureLearn and NPTEL are on opposite sides of the spectrum in terms of their social features (See **Section 2.7**), this study explored to what extent did the design of the platform impact whether learners from India valued social engagement, not just with other learners but also with instructors on the MOOC.

3.3.2.3 Challenges faced by MOOC Learners

Learners face a variety of challenges unique to MOOCs, and this study explored to what extent learners from India, on the platforms of NPTEL and FutureLearn, had their experience on MOOCs negatively impacted through these challenges.

Most notable in the challenges faced by MOOC learners is the low motivation to complete course-related activity due to a lack of incentive or purpose (Fini, 2009). Unlike paid online courses, MOOCs are, for the most part, free to access, and as a result, learners may not feel the usual commitments or pressures that would come along with signing on to a paid course. Another related challenge that is highly cited by learners is the supposed lack of time (Belanger & Thronton, 2013; Bonk & Lee, 2018) learners are able to devote to the MOOC. One study found that even among active interviewed participants, 78% of them claimed a lack of time to be a primary barrier towards their completion of a MOOC (Shapiro et al., 2017). Many learners underestimated the amount of time that would be needed to keep up with a university-level online course, with the same study finding that "Although both courses provided estimates that greater than six hours per week would be needed for success in the course (published on their landing pages), many students attempted to stay in the course while devoting substantially fewer hours." (ibid., p. 46). This suggests that learners should possess some Self-Directed Learning skills (See **Section 3.2.2**) to be able to stay motivated and create time around their lives and dedicate enough for the MOOC.

Further, some learners have said that they may possess insufficient knowledge about the subject being studied, or might find it hard to understand some of the content, without any ability for further guidance or clarification (Belanger & Thronton, 2013). This may be even more prominent in developing contexts like India, where the difficulty level of content, language preference of learners, the accent of the instructors, and lack of relatability to the local curriculum might pose challenges that may hinder the ability for learners to experience the MOOC fully.

Cost, too, is an essential factor to consider as a significant barrier preventing learners from having a positive experience with MOOCs. Many learners identify the benefit of a certificate that a MOOC might provide, but for some, more so in developing contexts, the cost of signing up for a MOOC may be too prohibitive (Bonk & Lee, 2018). While most MOOC providers started by offering free certifications of completion to learners, as discussed in **Section 2.2.2**, the number of free offerings have steadily declined over the years, with MOOC providers trying to recoup their investment and make a profit. The lack

of free certification could be playing a significant role in preventing learners from contexts like India from enrolling on a MOOC. These certificates, despite being an extrinsic motivator that may attract many more learners to the course, might be inadvertently alienating populations of learners that cannot afford to pay the cost of a certificate, especially in the context of India, where an average $74 premium certificate from FutureLearn, for instance, is often well beyond the means of the average learner.

Arguably the most significant barrier to entry in a developing country context such as India, are the technology-related issues (Bonk & Lee, 2018; Jain, 2018). While unique methods have been implemented to incorporate low-tech solutions for India, as outlined in **Section 2.6**, MOOCs, for the most part, still depend on streaming video as a method of delivery of content. By its online nature, it requires learners to have a working, stable internet connection to be able to complete assessments and other tasks on the MOOC as well. While learners from Western contexts could consider a stable internet as a given, such a luxury is not present for learners in countries with poor internet connectivity (Shapiro et al., 2017), such as India. Hence, while the flexibility of on-the-go learning has been propagated as one of the main affordances of MOOCs, these arguments fail to consider the limited connectivity present around the world, where internet-based learning actually ends up restricting the places in which one can learn (i.e. places with stable connectivity/bandwidth).

3.3.3 Summary

This section discussed how early connectivist MOOC research emphasised the learner perspective and identified some of the key metacognitive skills needed to navigate this new form of learning. Through the large amount of data typically collected in MOOCs, learners have been classified based on their patterns of engagement, with studies showing almost half of total enrolments on MOOCs never access the platform after enrolling. Further, the rest of the classifications of learners tend to be fluid, and their patterns of engagement with MOOCs varies, with some learners defining their own goals and requirements from the course, which may differ from the platform's definition of 'completion'.

This section went on to discuss the potential social aspects of learning in MOOCs, especially as FutureLearn puts such an emphasis on social learning, with studies identifying

a strong correlation between social activity and persistence in MOOCs. This study was interested in identifying the extent to which learners from India identify social aspects of learning as being of importance to their learning experience, and whether any differences exist in their perceptions based on the platform.

This section also discussed some of the challenges faced by learners on MOOCs. Learners have reported a lack of incentive, and a lack of time, as being some of the main challenges affecting their ability to complete MOOCs. These factors are linked closely to the idea of motivation, as highlighted in **Section 3.2**. Some learners find that they might lack the knowledge needed to take the MOOC, or feel they lack the support that usually is present in more formal settings. Another barrier, especially relevant in the Indian context, is that of the cost of gaining a MOOC certificate. While the problems around the potential value of a MOOC certificate have been discussed in **Section 2.2**, the cost of some certificates might alienate learners that would be in a position to most benefit from additional educational certification. Lastly, and most importantly to this study, were the technical challenges learners faced. The requirement of a stable internet connection to access mostly video-based MOOC resources has a potentially crippling role in contexts such as India, which have yet to develop the infrastructure for stable internet, especially in more rural areas.

While the learner has been at the forefront of most empirical research on MOOCs, only 18.5% of these studies have adopted qualitative methods (Zhu et al., 2017), aimed at getting a deeper understanding of learners and their unique perspectives on MOOCs. The study outlined in this thesis aimed to meet this need for more qualitative research into MOOC learner experiences, and by using a Mixed-Methods approach, this study went further in using both qualitative and quantitative methods to make sense of the varied experiences of learners from India on the platforms of NPTEL and FutureLearn.

3.4 MOOCs as Neo-Colonialism

> *Many existing education systems still bear the hallmarks of the colonial encounter in that they remain elitist, lack relevance to local realities and are often at vartiance with indigenous knowledge systems, values and beliefs.* (Crossley & Tikly, 2004, p. 149)

Neo-colonialism has broadly been defined as the use of indirect means, usually economic, political, cultural and social, to control or influence other countries, mainly former colonies in the Global South. While neo-colonialism could be considered a covert policy of former colonisers to maintain their hegemonic influence on nations in the Global South, within many education systems, it is likely a continuation of the practices adopted during colonial rule. However, as Altbach (1971, p. 237) points out, "The educational systems of most developing countries, on almost all levels, remain rooted in the administrative structures of the former colonial rulers. The colonial power may not be the direct cause of this situation, but the fact that the structure and organization of the schools reflect a foreign model necessarily has an impact on the nature of the education provided.". The effects of such systems often privilege Western conceptions of knowledge and value over indigenous ones, and, in fact, the very concepts of 'truth' and knowledge are arguably linked to colonial domination, where "the 'truth' found in modern subject disciplines demarcated by 'English', 'History',' Maths', and 'Science' consist of culturally privileged knowledges and exclusions, and that subject boundaries and specialist language legitimates some knowledges and outlaws others" (Hickling-Hudson, Matthews, & Woods, 2004, p. 6). This "overemphasis on content at the expense of context" (J. Knox, 2013, p. 25) with the fetishization of 'knowledge' as a consumable item, without much consideration of the implicit cultural assumptions is symptomatic of the neoliberal marketisation of education (Molesworth, Scullion, & Nixon, 2011), and with the Indian government adopting technocentric solutions to its educational challenges (Burch & Miglani, 2018), such as MOOCs, it is worth investigating the extent to which neo-colonialism plays a role in Indian higher education, and the role of Western MOOCs in perpetuating the superiority of Western ideas of knowledge.

The higher education system in India is inexplicably linked to its colonial roots. As highlighted in **Section 3.1.1**, English is the predominant language used in Indian Higher Education, and this is a direct consequence of India's colonial history. This has been advantageous for India, both internally – as English acts a common unifying language among the varied ethnic groups of India, as well as externally – as English allows Indians to communicate with a global audience with more ease (Vaish, 2008), and is evidenced by the large number of enrolments of Indians on Western MOOCs (Nair, 2013). However, this reliance on English has also side-lined indigenous forms of knowledge and given prominence to Western forms of knowledge (Yeravdekar & Tiwari, 2014).

The liberalisation of India's economy in the 1990s, opening up the country for foreign businesses, led to a flood of international universities attempting to gain a foothold in India. However, such universities often view higher education "as a tradable commodity that can be bought and sold internationally" (Altbach, 2008, p. 19), without taking into account the needs of the underserved classes in society. Such ventures, driven by the profit motive, focus their offerings to 'in-demand' fields such as management studies or computer science, and not in less profitable avenues such as building world-class research universities (ibid.). This marketisation of higher education has been seen to be symptomatic of a neoliberal agenda, viewing higher education as merely a means to secure a job (Molesworth et al., 2011), with students seen as consumers, and education as a consumable product. International students, particularly from nations like China and India, are seen as money-makers for many universities in the West (Stein & Andreotti, 2016), who project their prestigious status to attract learners from these countries. Employers in India, both in the private sector, as well as within academia, highly value a Western education over an Indian one (British Council, 2014a), and once these students return to India, they "return home with understandings and orientations that are likely to support the maintenance and promulgation of a particularly Eurocentric mode of education" (Nguyen, Elliott, Terlouw, & Pilot, 2009, p. 3). Indian scholars too, have an indirect dependence on the Western academic system, as considerable funding for research, as well as the prestige of publishing in Western journals, has made Indian academics in the social sciences *intellectually dependent* on the West (Alatas, 2000, p. 82).

All these factors further perpetuate the notion of Western forms of knowledge holding a more privileged position in Indian higher education, and society more generally.

With the arrival of MOOCs, some have argued that the commodification of the MOOC is another symptom of the neo-liberalisation of education. This was certainly the case in the early days of MOOCs, when much press coverage was focused on the disruptive potential of MOOCs (Outlined in **Section 2.2**). "The oft-repeated notion that MOOCs are good for everyone—businesses, administrators, professors and students alike—is a techno-utopian claim that obscures how new technology may serve the power interests of some and disadvantage others." (Mirrlees & Alvi, 2014, p. 47). Similar claims have been argued about the open education movement in general, claiming that the delivery of Western resources for a global audience implies the existence of an agenda driven by the forces of a competitive global marketplace for education (Huijser, Bedford, & Bull, 2008). There have been suggestions that OER are a form of neo-colonialism, with developing countries remaining passive users of content with no expectation of reciprocity (Glennie, Harley, Butcher, & Wyk, 2012). edX and Coursera founders claimed that these courses brought about a 'democratisation' of learning (A. Agarwal, 2013; Koller, 2012), giving learners across the world equal access to knowledge. This line of thinking, however, assumes that knowledge is culturally neutral (Altbach, 2014), and not shaped by the norms and biases of the dominant culture. How MOOC videos are produced, for instance, are influenced by national culture, which, if not carefully considered, "create a mismatch between the learners' culture and the culture reflected in MOOCs videos, [and] can create a gap in the learner's understanding of the video material." (Bayeck & Choi, 2018, p. 193).

While these biases may be less apparent in a Computer Science MOOC, they become far more evident in the humanities and social sciences. Reflecting on a MOOC on *Critical Thinking for Global Challenges*, Wahyudi and Malik (2014, p. 250) argue that "the course reinforced cultural and technological hegemony instead of deconstructing it through its pedagogical and technological design". A counter-argument proposed by Altbach (2014) suggests what he terms a "neo-colonialism of the willing", arguing that academics that deliver MOOCs are not necessarily conspiring to impose Western pedagogy and knowledge on the Global South, but rather, that this represents an unintended

consequence of the globalised classroom, with MOOCs strengthening the dominant academic culture of the West, possibly making it more challenging for alternative voices to be heard. Therefore, an argument could be made to Western MOOC providers to develop courses which appropriately contextualise topics for a global audience, while at the same time acknowledging broader global narratives and debates that shape knowledge.

3.5 Summary of Chapter

This chapter highlighted some of the key literature surrounding the three themes of this study, MOOC Learner Demographics, Motivations, and Experiences.

The literature suggested that MOOC learners, for the most part, tend to be already educated, primarily male, and likely to be in some form of employment. Further, existing platform level analyses showed that learners from the Global South tend to be at a disadvantage and have lower completion rates than learners from the West. These findings put into doubt the notion of MOOCs as vehicles for development in the Global South, and raised the need for research in contexts such as India, to better understand to what extent are these findings similar to Indian learners.

The literature identified that learners are motivated to enrol in MOOCs for a variety of reasons, from intrinsic reasons such as personal development, to extrinsic reasons, such as career or academic development. However, as the demographics of learners were so varied, so too were their patterns of motivation, and learner reasons for enrolling in MOOCs tended to depend on the discipline of the MOOC. Further, this section unpacked two concepts used to understand learner motivation in MOOCs, SDL and SRL, and identified studies which indicate a relation between persistence in MOOCs and learners using SDL and SRL skills.

Next, this chapter explored the literature on learner experiences in MOOCs. Early MOOC research on connectivist MOOCs highlighted how learners often feel overwhelmed unless they possessed the critical skills needed to navigate the course. Within *xMOOC* literature, several classifications of learners have been developed based on their patterns of engagement in MOOCs, and the literature suggests that while only a small number of learners engage in meaningful social interactions in MOOCs, social activity is one of the strongest predictors of persistence in MOOCs.

Next, this chapter highlighted some of the challenges learners faced, as reported in the literature. Studies reported a lack of time, motivation and structured learning as some of the significant challenges that learners reported. The high cost of certification and lack of

stable internet connectivity have also been identified in the literature to be barriers to learner success, especially in Global South contexts.

Lastly, this chapter discussed the notion of MOOCs as a form of neo-colonialism. It contextualised the Indian higher education system as still being intellectually dependent on its colonial past, and considered the nuanced methods by which the provision of Western MOOCs for an Indian audience could be considered a form of neo-colonialism.

Now that the literature on the three themes of this study has been explored and synthesised, this thesis explored to what extent these studies and their findings correlate with learners from India. The next chapter outlines the Methodology, along with the design and analysis of each stage of this study.

Chapter 4: Methodology

This chapter outlines the methodological basis of the current study, as well as a discussion of the research methods used to gather the data necessary to answer the Research Questions, which, as a reminder, are:

RQ1(a): What, if any, are the differences in demographics of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these demographics differ, if at all, from MOOC learners more generally, as identified in existing studies.

RQ1(b): What, if any, are the differences in the motivations of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these motivations differ from MOOC learners more generally, as identified in existing studies.

RQ1(c): What, if any, are the differences in the experiences of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these experiences different from MOOC learners more generally, as identified in existing studies.

Section 4.1 outlines the Research Paradigms and the Pragmatic approach chosen for this study; **Section 4.2** discusses the research methods chosen and the alternative methods that were considered. **Section 4.3** discusses the research design, outlining the various phases of this study, including the design of each research instrument, participant recruitment, and analysis methods used for each phase and **Section 4.4** discusses the Ethical Concerns that were identified and managed for this study.

4.1 Research Paradigms and the Pragmatic Approach

Prior to the discussion of selecting appropriate methods to answer the research questions of a study, it is useful to outline the researcher's world view, that is, the primary set of beliefs and philosophical assumptions the researcher holds about the world and the nature of knowledge (Guba & Lincoln, 1994, p. 107). This section outlines the main research paradigms, and why a pragmatic position was chosen for this study.

According to Creswell (2007, p. 6), there are four main paradigms for social research that aims to combine qualitative and quantitative methods:

Postpositivism: A deterministic philosophy, those who accept this view believe in a probable cause-and-effect to explain most phenomena. It is reductionist in nature, where the researcher makes and tests hypotheses, refining or abandoning their claims in favour of stronger ones. Within postpositivism, claims about knowledge can never be proven, as absolute truth can never be found, and according to postpositivists, the pursuit of knowledge does not necessitate a commitment to a claim of absolute truth (Phillips & Burbules, 2000, p. 3). Hence, postpositivists hold the belief that any evidence established through research is imperfect and fallible. While postpositivist researchers can make use of both qualitative and quantitative research methods (A. B. Ryan, 2006, p. 10), underlying postpositivist research is the notion of being *objective*, that is, researchers must evaluate their methods and findings for bias and try to eliminate bias from their analysis, which makes this position more suited towards quantitative methods, with their rigorous standards towards validity and reliability of research (Creswell, 2009)

Constructivism: The constructivist, or social constructivist or interpretivist world view believes that knowledge is constructed by individual human beings as they engage with the world, interpreting the world based on their historical and social perspectives (Barbour, 2007). Constructivists believe, contrary to postpositivists, that there does exist an 'absolute truth', but human beings are only able to approximate the understandings of absolute truth, due to our limited intellectual mechanisms (Hershberg, 2014, p. 6). Constructivist researchers often employ an inductive approach to research, where meaning is generated from the data collected in the field through the research process, rather than through the testing of a hypothesis, where knowledge can be *discovered*.

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Transformativism: A transformative paradigm believes that research inquiry must be closely linked with a political motive to confront social oppression. These researchers include critical theorists, participatory action researchers, Marxists, and Feminists, among others. These researchers tend to focus on the study of the lives and experiences of groups that have been traditionally marginalised, and explore notions of oppression, domination and power relationships. Research on learners in the Global South typically could benefit from a transformative paradigm, and as outlined in **Section 3.1.1**, there have been suggestions that the delivery of Western MOOCs to learners in the Global South has neo-colonial implications (Altbach, 2014). This study does acknowledge the inherent cultural power dynamics at play within MOOCs, and the comparison of a low-budget government-funded Indian platform with a high-budget privately funded Western platform does highlight these inequities. More broadly, this study was also sceptical of notions of Western MOOCs as being vehicles for development in the Global South. However, as this study was exploratory in nature, the goal was not necessarily to enact social transformation through this research, but rather, to understand the learner and their experiences with MOOCs, in their own words with a theoretically minimalist approach, and provide practical recommendations to the varied stakeholders to consider when offering MOOCs to learners from India.

Pragmatism: A pragmatic paradigm leaves researchers free to choose the methods, techniques and procedures of research that best suit their research questions. For pragmatic researchers, truth is "what works at the time. It is not based in a duality between reality independent of the mind or within the mind" (Creswell, 2009, p. 11). Researchers, therefore, can use a combination of both quantitative and qualitative data to make sense of the world.

Pragmatists hold an "antirepresentational view of knowledge" arguing that research should no longer aim to most accurately represent reality, to provide an "accurate account of how things are in themselves" but rather, to be useful, and to "aim at utility for us" (Rorty, 1999, p.xxvi: cited in Feilzer, 2010, p. 8). This pragmatic position for research to aim for a practical utility was considered appropriate for this study, as discussed earlier, this study intended

to provide practical recommendations to MOOC providers, instructors and policymakers, while reflecting more generally on the role MOOCs could have in the Indian context.

Through this pragmatic lens, this study chose not to consider analysing the data through existing theoretical frameworks of learning, but rather explore the authentic accounts of learners, in their own words, not bound by Western-centric frameworks. In a rapidly evolving discipline like MOOC research, as Raffaghelli et al. (2015, p. 506) argue, "applying a scheme to a changing flux can end up in imposing a scheme that might mislead rather than guide the creation of knowledge.". Further, Miller (2007, p. 181) suggests the that social sciences can benefit from studies with little theoretical underpinning, especially when exploring new contexts, with labels like mixed-methods reinforcing the binary positioning of qualitative and quantitative research (Symonds & Gorard, 2010, p. 15) instead of considering the *reintegration* (Hammersley, 2004, p. 201) of the two methods.

The research paradigms outlined above, all acknowledge to some extent the existence of fallibility and the effects of bias but are also very much rooted in a Western tradition. Looker (2018) suggests that much of the scholarship of teaching and learning conform to Western notions of what is 'valuable in education', and if Western scholarship is to be considered meaningful in international contexts, 'it needs both to embrace and be explicit about sociocultural influences and, crucially, it needs to be decentred from Western hegemonic practice.' (ibid. p. 112). With Western MOOC platforms essentially serving as international repositories of learning, Altbach (2014, p. 5) notes:

> The dominant ideas from these [Western] centers will dominate academic discourse, and will be reflected in the thinking and orientations of most of those planning and teaching MOOCs. MOOC gatekeepers, such as Coursera, Udacity, and others, will seek to maintain standards as they interpret them, and this will no doubt strengthen the hegemony of Western methodologies and orientations.

Since the goal of this study was to understand the authentic learner motivations and experiences in the Indian context and to draw comparisons in this context between an Indian and Western platform, it was decided that an exploratory, pragmatic and theoretically minimal approach would be followed.

4.2 Research Methods Chosen and Alternatives Considered

> *At the level of translating epistemological concerns into research methodology and finally the decision of research methods, a pragmatic paradigm, poses some methodological questions. If phenomena have different layers how can these layers be measured or observed? Mixed methods research offers to plug this gap by using quantitative methods to measure some aspects of the phenomenon in question and qualitative methods for others.* (Feilzer, 2010, p. 8)

In any research study, **the research questions** should be of prime importance when choosing appropriate research methods (Creswell & Clark, 2007; Tashakkori & Teddlie, 2003). It is therefore essential to identify the sorts of data that would be needed to answer each of the research questions, in order to select the most appropriate methods. The overarching research question of this study concerns **three themes, namely, Indian learner demographics, motivations, and experiences**. These themes differ considerably from one another, and the types of data, as well as data collection methods that would best describe and allow exploration of each theme are quite disparate. In addition to these themes, further extraneous variables need to be considered before research conclusions can be reached, acknowledging the fact that human experiences are rich, unique and varied and are considerably challenging to *measure* (Cohen, Manion, & Morrison, 2011). Clickstream data can tell us how often learners visit the platform, how long they stay engaged with video or assessment activity (Brinton, Buccapatnam, Chiang, & Poor, 2015; Sinha, Jermann, Li, & Dillenbourg, 2014), and can even make predictions based on those patterns about a learners' likelihood to persist with the MOOC (de Barba et al., 2016; Jung & Lee, 2018; Roy et al., 2014; Whitehill et al., 2017). None of these methods, however, explore the authentic lived experiences of these learners. Research into these

experiences[13] should, therefore, consider using methods that best capture the learning experience, rather than merely attempting to measure it quantitatively. On the other hand, learner demographics, once collected, are in theory, much easier to describe, and allow for a comparatively more straightforward quantitative analysis. The varied nature of the sorts of data required to answer the research questions led to the consideration of a number of alternative methods, before narrowing down on the most appropriate method to answer them. The following section discusses the rationale of the selected mixed-methods research design, followed by a discussion of alternative methods that were considered when designing the study.

4.2.1 Mixed Methods Research

As discussed in **Section 4.1,** the pragmatic perspective is best suited to mixed methods research (Creswell & Clark, 2011), which gives primal importance to the research problem and question, valuing both objective and subjective knowledge (Meissner, Creswell, Klassen, Plano, & Smith, 2011). Greene (2008) acknowledges that while mixed methods research provides a diversity of perspectives and multiple legitimate approaches to social inquiry, there is an underlying assumption that any given approach to social inquiry is inevitably partial, and can never provide a "true" version of reality. She goes on to suggest that "mixed methods approach to social inquiry distinctively offers deep and potentially inspirational and catalytic opportunities to meaningfully engage with the differences that matter in today's troubled world, seeking not so much convergence and consensus as opportunities for respectful listening and understanding." (Greene, 2008, p. 20)

The current research questions are focused on three key themes: the demographics of Indian learners on MOOCs; factors that motivate these learners to sign on to, and complete

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[13] For this study, 'learner experience' is defined as the subjective perceptions of learners about their attitudes, behaviours, concerns and evaluation of their own process of learning in MOOCs.

MOOCs, and their experiences – that is, their perceptions about their attitudes, behaviours and concerns, as well as an evaluation of their own process of learning in MOOCs. **Table 1** links each of the Research Questions of this study with the type of data that was collected to help answer them. A quantitative approach, through survey metrics, is better suited to uncover the demographics of learners, while a qualitative approach is better suited to uncover the motivations and experiences of these learners. While qualitative research is often hard to generalise beyond the studied context, quantitative studies often lack more in-depth insight into the phenomenon being studied (Meissner et al., 2011). Mixed methods research involves the intentional juxtaposition of qualitative and quantitative methods, in order to take advantage of the strengths of both methodologies (Driscoll, Appiah-Yeboah, Salib, & Rupert, 2007).

Further, a broader range of learners can be asked about their motivations and experience through quantitative Likert-type items, while in-depth qualitative interviews with a smaller set of learners can explore to what extent the survey findings match those of the authentic accounts of some of the learners, while at the same time highlighting the uniqueness of each individual learner and his or her experience with MOOCs. For these reasons, a mixed methods approach is considered appropriate for this study.

Table 1: Research Questions and the data types gathered to answer them

Research Questions	Quantitative Data	Qualitative Data
RQ1(a) Demographics	Demographic Survey	
RQ1(b) Motivation	Motivation Likert-type items	Semi-structured Interviews
RQ1(c) Experiences	Experiences Likert-type items	Semi-structured Interviews

Those critical of mixed-methods research have argued that the two epistemological positions of positivism and constructivism are not compatible (Guba & Lincoln, 1994), and that mixed methods research, when done without situating the study within the underlying assumptions, beliefs and politics, might be reinstalling positivism "as the most respected form of social research while at the same time – through inclusion – neutralising

the oppositional potential of other paradigms and methodologies that more commonly use qualitative methods." (Giddings & Grant, 2007, p. 13) . As mixed-methods research has become increasingly popular among social scientists, methods purists on both ends of the spectrum have argued that survey measurement enables researchers to transcend our subjectivity (Bradley & Schaefer, 1998) by providing a more accurate picture of social phenomena, or that only true qualitative methods allow for data to emerge more freely from the context being studied (Gergen & Gergen, 2000; Patton, 2005).

Mixed-methods research, however, is primarily concerned with the research problem that needs to be solved and identifying the most suitable methods for solving this problem, benefiting from the advantages of positivist and constructivist positions. This could be considered a pragmatic position that recognises that the positivist notion of 'objectivity', that is, the ability to conduct research without the influence of one's own values, beliefs and biases (Payne & Payne, 2011, p. 153) is quite problematic within the social sciences, while at the same time acknowledging that purely interpretivist studies, which might contain valuable and productive insights into the lived experiences of the participants, are often challenging to generalise beyond the particular context being studied.

4.2.2 Alternative Research Approaches Considered

A number of alternative research approaches to those employed in the current study were considered. With the vast amounts of learner data available through the massive nature of MOOCs, there is a tendency to consider an analytics-driven quantitative approach to research. As Veletsianos, Collier and Schneider (2015) point out, the availability of big sets of data seems to have shaped the research questions that are being asked about MOOCs. In fact, as Gasevic et al. (Gašević, Kovanović, Joksimović, & Siemens, 2014) have identified, there already is an existing fragmentation of researchers interested in MOOCs: On the one hand, education researchers, who use a combination of mixed and qualitative methods in their research, and on the other, computer scientists, with a technology-focused quantitative lens. Analysis of existing MOOC literature between 2013-2015 has shown that a majority of studies are being undertaken by computer scientists (Veletsianos, 2015) using mostly quantitative analyses of log data generated through MOOCs.

One approach to exploring the experiences of Indian learners in MOOCs would have been to use a learning analytics-based approach, analysing learners' clickstream behaviour on the MOOC, and categorising different types of learners based on their patterns of behaviour. As discussed in **Section 3.3**, this has been one of the more common forms of research into the learner perspective in MOOCs. While learning analytics can provide useful, timely information about learner behaviour, the complexities of the human condition often are not limited to a number of data points that can be tracked through clickstream analysis alone, and therefore there is a need to balance this data with a more naturalistic approach in order to generate a more holistic understanding of the issues around learner experiences (Cohen et al., 2011). Quantitative studies can inform us about what learners are doing in MOOCs, and learning analytics could potentially provide an incredibly detailed measure of it; however, it is qualitative analysis that can uncover *why* learners are doing it (Veletsianos et al., 2015). Further, as MOOC log data is often heavily guarded through institutional privacy guidelines, it would have been quite challenging to acquire this data, particularly from the Indian platform. For these reasons, while learning analytics approaches may have enriched the findings from the survey and helped in the triangulation of data alongside the interviews into learners' experiences, as this study considered platform-level comparisons, this approach was considered unfeasible for this study.

In earlier iterations of this research study, in order to generate rich qualitative account of learner experiences in MOOCs, an ethnographic method was proposed. In this method, the researcher would embed himself in an Indian MOOC and collect data through field notes and observations, coupled with interviews with learners, borrowing its methodology from the researcher's Master's thesis (Sanzgiri, 2013), which was a micro-ethnography of a single MOOC. While this study provided insight into the process of taking a MOOC through the accounts of both the interviewed participants and the researcher himself, a number of challenges were identified with using this method for this study. Ethnographies tend to run for an extended period, during which the researcher can appropriately embed himself within the community (Mills & Morton, 2012). However, as was identified in the study above (Sanzgiri, 2013), the very notion of community in a MOOC is a contested one,

and whether discussion forums where learners, for the most part, engage in asking and answering queries between strangers with no future contact could be considered a *community* was questionable. As ethnographic studies rely on there being a relatively stable community to observe and be a part of (Hammersley, 2006), there were concerns about how valid such an ethnography would indeed be. However, most importantly, while ethnographies often describe a phenomenon in vivid detail, one of the most frequent criticisms of the method is its lack of generalizability beyond the specific context being observed (Hammersley, 1992). As most studies of MOOCs tend to follow the single MOOC case-study format, this study aimed to do a cross-platform comparison of learners and their experiences, which would be unfeasible with an ethnographic methodology. For these reasons, a purely qualitative ethnographic account of a MOOC was discarded as a possible method.

Lastly, as discussed in **Section 3.3,** most studies on MOOCs tend to be isolated case studies of single courses, or a collection of courses from a single university or platform (Belanger & Thronton, 2013; Ho et al., 2015; University of Edinburgh, 2013) primarily due to a lack of data sharing and institutional restrictions. As MOOCs encompass a wide variety of disciplines and offer differing levels of challenge to learners, there is a need for more research into the broader variety of experiences learners might have with different types of MOOCs. Further, as an exploratory study of a subset of learners in a MOOC, the single case study approach would not be appropriate for the desired national perspective. For these reasons, to get a greater understanding of Indian learners' demographics, motivations as well as their experiences and challenges faced on the two platforms of FutureLearn and NPTEL, a mixed-methods approach was chosen to answer the research questions.

4.3 Research Design

The study was designed to have three phases. **Table 2** outlines the timelines of each Phase of data collection. In Phase 1, semi-structured interviews were conducted with select Indian MOOC learners to get a sense of some of the main factors that impact the Indian learner in the MOOC. A thematic analysis of the Phase 1 interviews, as well as a study of existing survey instruments used in MOOC studies, influenced the design of a survey, which was

deployed in Phase 2 of the study. After an analysis of the survey data, participants were recruited from both NPTEL and FutureLearn to take part in semi-structured interviews, which was Phase 3 of this study. The remainder of this section will provide a justification for the design of this research study and various methods employed, as well as the findings of the pilot study and how they influenced the design of the survey instrument.

Table 2: Timeline of each Phase of Study

Phase of Study	Method of Data Collection	Dates of Collection
Phase One	Pilot Interviews	January 2016
Phase Two	Survey	May – June 2016 (FutureLearn) July 2016-October 2016 (NPTEL)
Phase Three	Semi-Structured Interviews	December 2016-February 2017

While there are several similar typologies for mixed methods design with minor differences between them (Clark & Ivankova, 2017), Creswell (2007)'s typology of the four key factors to consider when designing a mixed-methods study is the most prominent, and the one that this section will consider. The four factors are **Timing, Weighting, Mixing** and **Theorizing**. These are represented below in Figure 11, as adapted from (Barbour, 2007; Doyle, Brady, & Byrne, 2016)
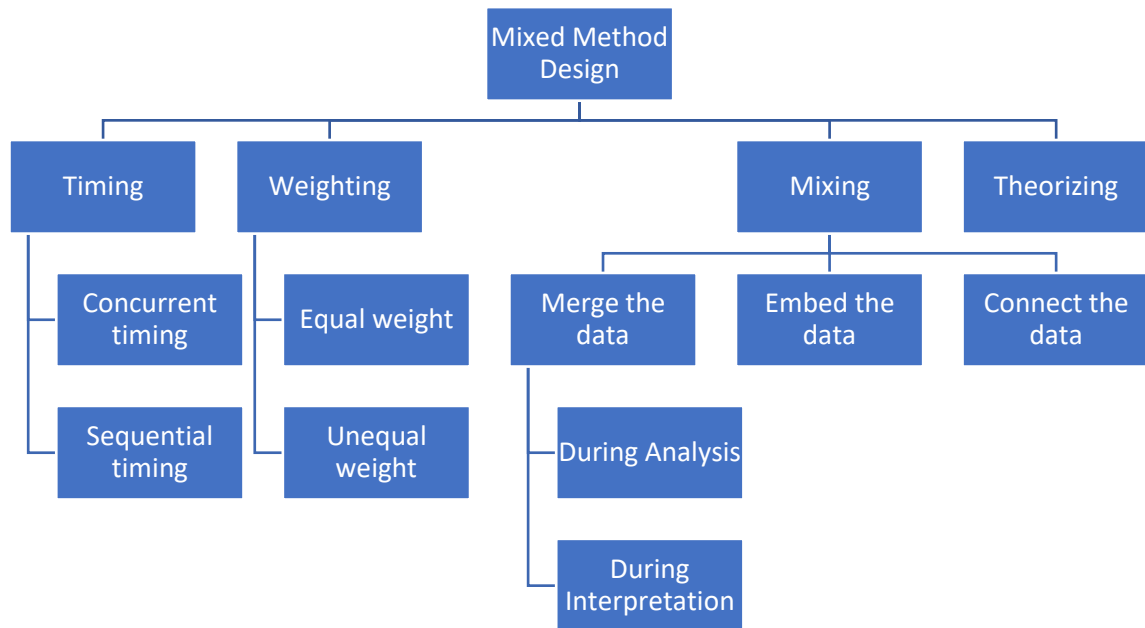
Timing here refers to whether the data collection occurs in sequential phases or is gathered concurrently. **Figure 12** shows three different types of mixed-methods design, as described by (Clark & Ivankova, 2017, p. 118). In the first design, both qualitative and quantitative strands of data collection occur concurrently, which are then combined and used to draw inferences based on a combination of the two sets of results. In the second and third example designs in Figure 12, one strand of data collection (either quantitative or qualitative) informs the design and collection of the next strand of data collection (qualitative or quantitative respectively). In both of these cases, the two sets of results are connected to draw inferences and answer the research questions.

Figure 12: Three Basic Mixed Methods Design Logics. Adapted from Clark and Ivankova (2017, p. 118)
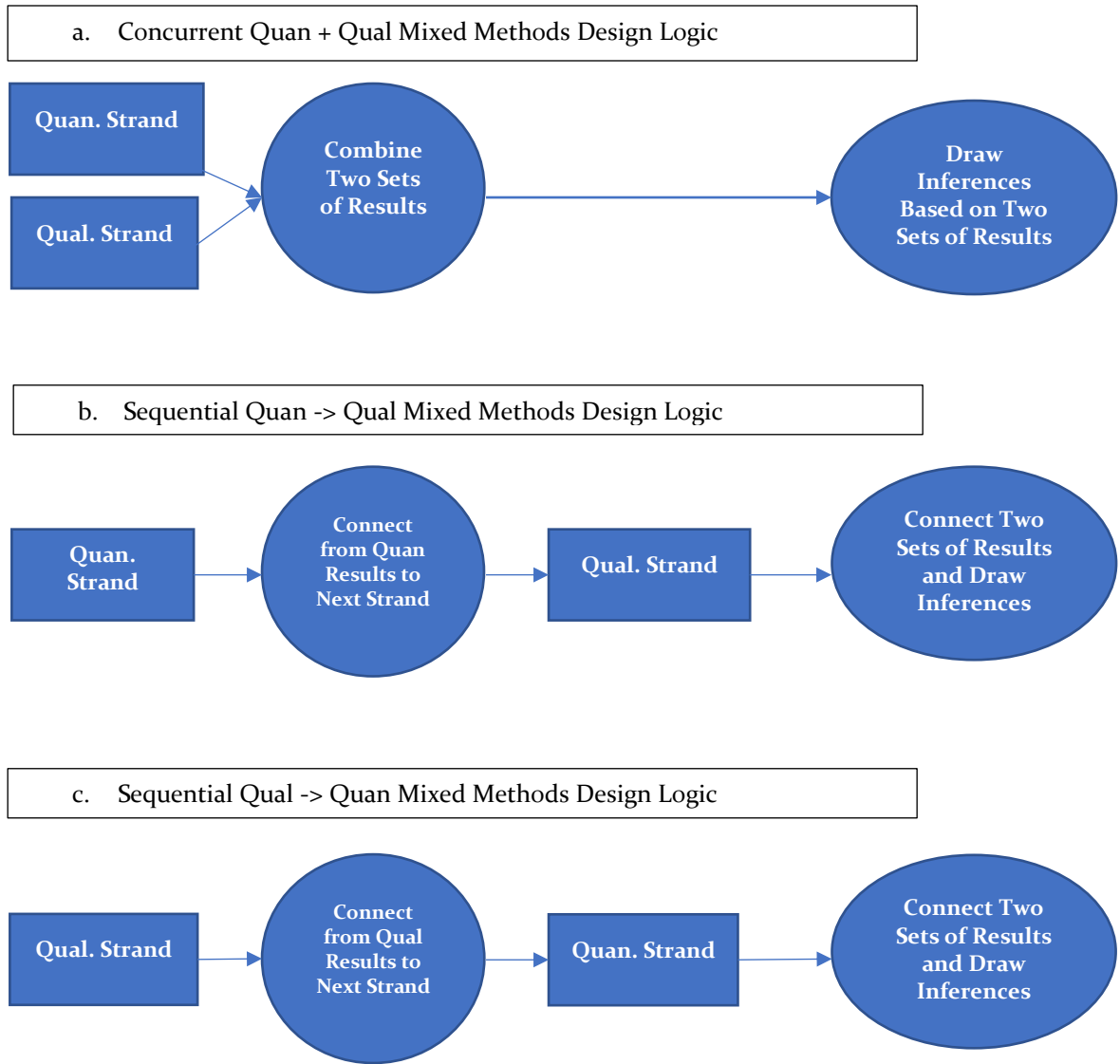
The current study follows a sequential design, based on its three phases of data collection. The sequential design of this study is illustrated in **Figure 13**. The qualitative pilot study informed the quantitative survey, which, in turn, informed the in-depth qualitative interviews. The findings from the survey and the interviews in Phase 3 were then mixed to discuss the key themes that emerged from the data, which led to the answers to the research questions of this study.

Figure 13: Research Design
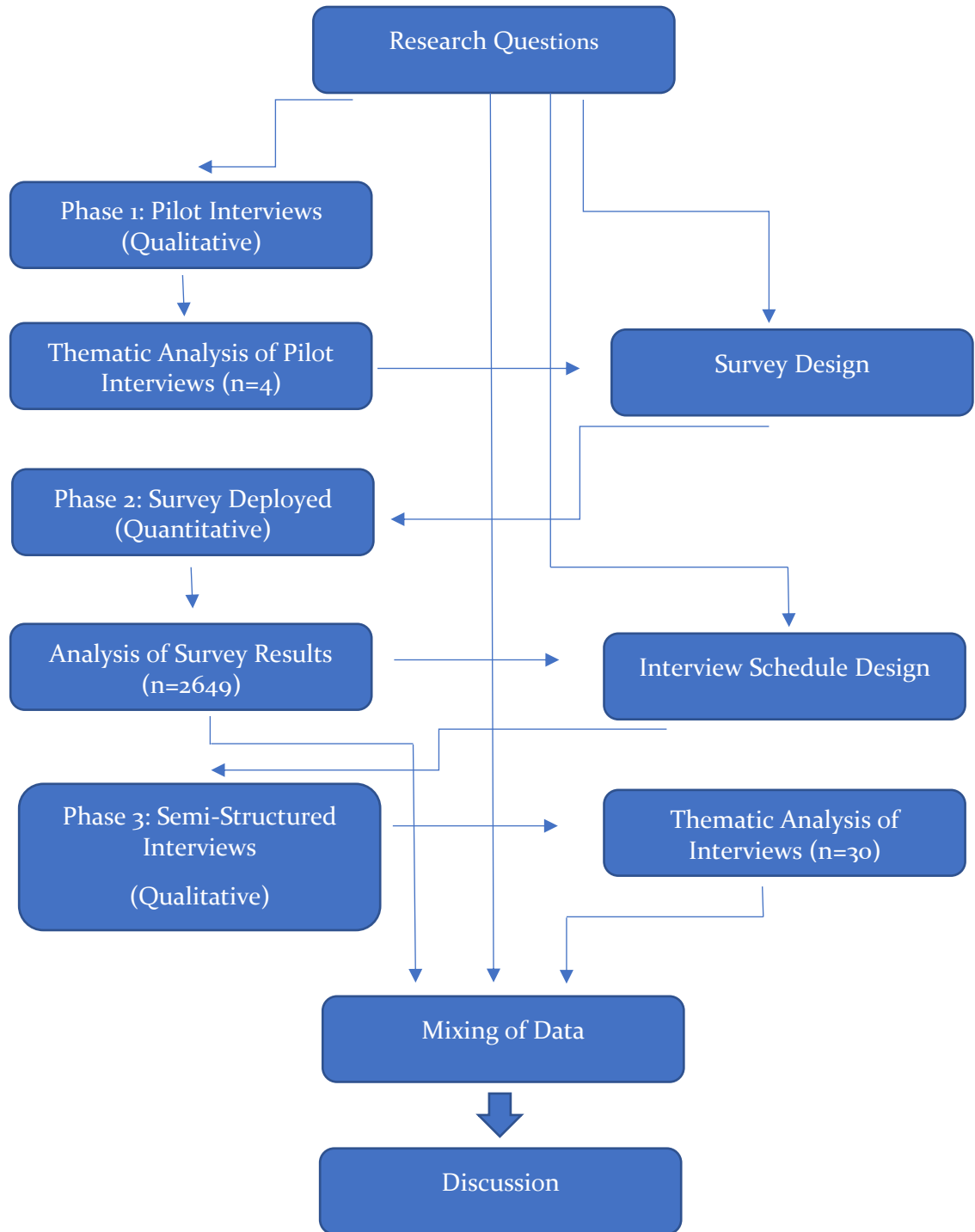
The next factor to consider is **Weighting** – there is a need to determine whether to prioritise qualitative or quantitative data or to give them equal weight (Ivankova, Creswell, & Stick, 2006). There are a number of factors that might determine why an emphasis is given to a particular form of data over another, ranging from the audience of the study, to whether the researcher is following an inductive (identifying themes from data) or deductive (testing a hypothesis) approach (Barbour, 2007). This study was primarily inductive, as it was exploratory in nature, and was not testing any specific hypothesis. Further, as elaborated in **Section 4.2**, two of the three themes (learner motivations and learner experiences) were better explored through more in-depth qualitative analysis through an authentic accounts of these learners in their own words, while the findings from the survey could help in triangulating the findings, and putting the experiences of the learners in a broader context. For these reasons, the qualitative data was given more weight than the quantitive in this mixed methods design.

The third factor to consider, according to Creswell (2007) is **Mixing** – of the data, as well a broader mixing of the research questions, philosophy and interpretation. Creswell goes on to further define three different types of mixes – Connected mixes, where qualitative and quantitative research, depending on the order of data collection, inform each other through their analysis; Integrated mixes, where both forms of data are collected concurrently and merged, for instance, through conversion of qualitative data into quantitative data through measuring counts of particular occurrences. Last is the Embedded mix, where the qualitative and quantitative data are separate from one another, with a clear dominant form of data (say, qualitative), with the other (quantitative) providing a supporting role in the study. This study follows a connected-mix design, where the quantitative survey results are used to inform the findings from the interviews, and to triangulate the analysis through verifying whether the survey responses match the findings from the interviews or not.

The final factor proposed by Creswell (2007), is the **theoretical** perspective of the researcher. He argues "all researchers bring theories, frameworks and hunches to their inquiries, and these theories may be made explicit in a mixed methods study, or be implicit and not mentioned". This particular study, primarily being an exploratory study of a new

form of online learning in an unexplored context, is influenced by the existing literature around the three themes of demographics, motivations and experiences of learners in MOOCs. In fact, part of each research question explicitly intends to compare the findings of this study with this existing literature, and to check to what extent do the findings from the Indian context, and from each platform being studied here, compare with the current literature on MOOCs. As discussed in **Section 4.1**, as a primarily inductive process, this study used a theoretically minimal mixed-methods approach. Due to the exploratory nature of this study, the intention was not to predetermine the interpretation of the findings through existing Western-focused theoretical lenses, but rather, to get an authentic understanding of learners from India. That being said, as discussed earlier, every researcher and every methodological perspective brings with them a set of biases and preconceptions, which could potentially influence the analysis. This is acknowledged, and the pragmatic position does not necessitate adherence to strict positivist notions of objectivity and unbiased research.

To summarise, this study used a sequential mixed-methods design, where the qualitative data from the pilot study informed the quantitative survey, which, in turn, informed the qualitative in-depth interviews. The following sections will now discuss the research methods employed in each of the three phases of the study.

4.3.1 Phase One: Pilot Interviews

Prior to the design of the main survey instrument, there was a need to explore some of the contextually specific factors that might influence the experiences and motivations of learners from India. While existing survey instruments exploring learners' motivations and experiences in MOOCs did exist (Christensen et al., 2013; Littlejohn et al., 2016), it was considered important to firstly explore to what extent do some of the items from within those studies apply to Indian learners. For this reason, open-ended interviews were conducted with four MOOC learners from India. Factors were identified in the motivations, experiences and challenges of learners that further helped in the design of the survey instrument, as well as specific web-based interview related skills that the researcher developed through these pilot interviews.

4.3.1.1 Participant Recruitment

For these pilot interviews, four participants were recruited through social networks, across three specific MOOCs on Coursera and edX. This section discusses the process by which the researcher identified, contacted and interviewed the participants for these pilot interviews.

The recruiting of participants in MOOC research was considered to be a challenging exercise, particularly as an outsider without any formal relations with the instructor or particular MOOC platform. As MOOC platforms generally forbid the recruitment of its learners by external researchers, participant recruitment at this stage had to be undertaken through social media platforms outside of the MOOC platform.

Studies have shown that some learners on MOOCs do socialise and interact outside the central MOOC platform (Veletsianos et al., 2015). For these reasons, specific MOOC Facebook groups were initially considered as a tool to recruit participants for the pilot interviews. Facebook has been used considerably in social science research as a platform to recruit participants, however, there has been critique as to whether the Facebook users are sufficiently heterogenous and representative of the larger population (Rife, Cate, Kosinski, & Stillwell, 2016). In the case of MOOCs, it is likely that the learners that take the additional step of joining social media groups around MOOCs, are likely to be active MOOC learners that have completed MOOCs (Veletsianos et al., 2015, p. 583), and may not be representative of the broader MOOC population that has a less than 10% completion rate. Representativeness of the sample of learners is one of the main limitations of any such study that requires self-reported information from participants and will be discussed in greater detail in **Section 7.3**.

Participants were initially contacted through their Facebook accounts based on their activity on MOOC Facebook groups; however, this proved ineffective, as Facebook filters prevented unsolicited messages from reaching participants. In response, the messaging application "WhatsApp" was used to contact participants who had shared their phone numbers publicly on the MOOC platform forums. It was observed that many MOOC forums, in their first week "Introduce yourself" prompt, often had a user-made thread specifically for Indian learners to connect with one another, and these learners would more

often than not post their mobile phone numbers, requesting to be added to a WhatsApp group created for Indian learners on that specific MOOC. This proved to be a far easier method to contact potential participants and achieved a far greater response rate compared to the Facebook users contacted initially to be interviewed. The ethical implications of this approach, and how they were managed in this instance, are discussed in **Section 4.4**

While initially Skype was considered as a medium through which to conduct the interviews, it was finally decided that the interviews would be conducted over the telephone, with an offer to use Skype or any other voice chatting platform of the participants' preference. Skype has yet to reach ubiquitous status within India and coupled with the potential connectivity issues, a telephone interview was considered more appropriate. This would later be extended in the Phase 3 Interviews as well.

It should be noted that at this stage of the Research Project, while the Research Questions and Design had been finalised, formal agreements with FutureLearn and NPTEL had not yet been in place for the advertising of the Research Study. Hence, the Western MOOC platforms of Coursera and edX, with their open forums, were chosen as recruitment sites, as the purpose of these interviews was to get a broad understanding of learners' perceptions of MOOCs, and to identify, through semi-structured interviews, whether there were any factors specific to Indian learners that may not be present in existing survey instruments, to better guide the design of the Phase 2 Research Instrument.

Participants were recruited based on their posting on the forums of three MOOCs in particular:

> *1) Programming for Everybody (Python) – The University of Michigan – Coursera*
> *2) CS101x – IIT Bombay – edX*
> *3) QM101.1x Statistics for Business – IIM Bangalore – edX*

The first MOOC on Coursera is popular among Indian learners as an introductory course in programming, with over 200,000 enrolments on the particular running of the course selected, while the second and third courses were the only courses that were active from

Indian universities at the time. It was observed that all three courses were technical in nature, and hence might attract a similar demographic. However, as the purpose of the initial pilot interviews was to get a general sense of some of the "India-specific" issues, rather than "discipline-specific" issues, the generalisability of the sample at this stage was not of concern.

An interview schedule based on general guiding statements, influenced by Veletsianos et al. (2015)'s study on learner experiences in MOOCs was drafted (see **Appendix 1**). After a few introductory questions on participants' awareness of MOOCs and their activity on them, the interviews proceeded to ask open-ended questions, about the key themes that emerged from the literature and were of relevance to participants' motivations and learning experience. Interviews were allowed to progress based on the participants' responses naturally and were purposely kept open-ended, to allow for themes and topics to organically emerge from the discussion.

The next section will include a brief discussion of the key findings from the interviews, and the ways in which they influenced the design of the survey instrument.

4.3.1.2 Key Findings and Analysis of Pilot Interviews

Four participants were interviewed (brief profiles can be found in **Appendix 2**), and using the constant comparison method (Stern, 2012) of analysis, once specific themes began recurring in the transcripts, further recruitment of participants was stopped. The goals of these pilot interviews were firstly to inform the design of the survey, secondly, to test the technical aspects of web-based interviewing, and lastly to evaluate the interviewer's comfort and style of building rapport and eliciting more in-depth responses from the interviewed participants. After four interviews, sufficient data was gathered for the pilot study and further interviews were stopped.

It is worth noting that all the participants interviewed in the pilot were male, relatively younger, and all seemed to be from a technology and engineering background. This is partly due to the courses chosen to recruit participants from, which would tend to be biased towards a younger male population, but also because, while two female learners were contacted based on their postings on the MOOC forums, neither responded to the researcher's attempts at recruitment. This does mean that any factors that might

specifically influence the motivations and experiences of female Indian learners could not be captured in the design of the survey instrument for Phase 2. That being said, as outlined in **Section 4.3.2.4**, the survey instrument, once designed, was piloted with female participants as well, to try and counteract this limitation.

The four interviews were conducted via phone, using Skype on the researcher's end, and were recorded and saved on the researcher's personal computer. The interviews were then transcribed and analysed using the grounded-theory based constant comparison method (Stern, 2012), adapted to fit the requirements of the short pilot study. This method of analysis "combines inductive category coding with a simultaneous comparison of all social incidents observed." (Goetz & LeCompte, 1981, p. 58). Each interview was transcribed and coded before the next, and the findings from the previous interviews guided the questioning on forthcoming interviews, to identify if specific themes related to being an 'Indian MOOC learner' emerged. Further detailed explanations of the transcription methods used in Phase 1, as well as Phase 3 interviews of this study, follows in **Section 4.3.3.4**.

Participants interviewed were, as anticipated by their activity on the MOOC forums, engaged MOOC participants, and were prolific in their usage of the particular platforms of edX and Coursera. Most had completed over two MOOCs, while one of the participants, pilot4_edX was the only participant that was in the process of taking his first MOOC and had yet to complete one.

When asked about why they chose to take the specific course they were recruited from, three of the four cited specific career and educational goals, while one, pilot2_edX, was taking these MOOCs out of personal interest in the subject. Of interest, pilot4_edX mentioned taking the MOOC on Computer Science from IIT on a recommendation of a friend to help him with his formal education, as he was completing a similar course at his college. This, coupled with the later announcement of NPTEL and SWAYAM MOOCs[14]

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[14] The pilot interviews were conducted between December 2015 and January 2016.

becoming further embedded within higher education in India (University Grants Commission, 2016) raised the need to question participants on the survey whether their motivation to take MOOCs was related to their formal studies.

The next issue that emerged from the pilot interviews related to the challenges these learners faced. Contrary to what was anticipated, none of the participants expressed any significant technical challenges with regards to connectivity, but mentioned that they downloaded course materials, and accessed and used them at their own convenience, later. In hindsight, these issues could have been expanded on further, as this emerged once again as a key theme in the Phase 3 Interviews, but nonetheless, questions about the flexibility and accessibility of videos, such as downloading, subtitling, slowing-down and speeding-up videos were added as Likert-type items to the survey instrument.

Two key experiential factors emerging out of the interviews that seemed to be unique to the Indian learner were an appreciation of the 'prestigious' nature of the institution offering the MOOC, and the perceived importance of instructor delivering the MOOC. As two of the three MOOCs which participants were recruited from were delivered by the prestigious Indian Institutes of Technology and Management (IIT and IIM), despite the lack of prompts on this specific subject area, participants would mention how great an opportunity it was to learn from these "great professors".

> pilot3_edX: I had tried to do the JEE[15] but did not get through, but now online we can see what we missed out on in these courses, and it's so great that these materials are available for free.

> pilot1_Coursera: It was so beautiful and so desiring that I always I wanted to always consult US courses just to see what it was like, and now I can through these courses.

Based on these findings, questions were included in the survey instrument regarding the perceived prestigious nature of the institution, as well as the instructor.

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[15] The Joint Entrance Examination for the IITs is one of the most competitive entrance examinations in India.

The last main finding that emerged from the pilot interviews, from two of the participants, was how they found the MOOC forums overwhelming and wished to branch out into smaller groups of learners, ideally based on location. Of interest, while this was their desire, they had yet to create these smaller social groups and had merely posted their desire to join a group in the introduction thread on the respective week one forum. This desire for breaking into smaller groups was not particularly surprising, as these participants were recruited by their posting on a forum thread sharing their phone numbers to join an "Indian Learner" WhatsApp group, but it also suggests that someone might have to take the lead and form and maintain these social networking groups around MOOCs, and at least from the participants interviewed, none were willing to take up the responsibility of doing so. As the social aspect was a critical part of the learning experience for the FutureLearn platform, based on these findings, it was decided that a question about social learning and the perceived "overwhelmingness" of the MOOC forums would be added to the survey instrument.

In summary, the pilot interviews provided valuable insight that allowed for the design of the survey instrument. In terms of motivations to take the course, assisting in formal education was identified as a potential motivator not considered earlier, and while NPTEL had yet to announce the formal MOOC credit framework at the time of these interviews (January 2016), this theme became all the more relevant in future Phases of this study. In terms of challenges faced by learners, nothing specific stood out as being unique to India, although two of the participants mentioned downloading course materials for later consumption at their convenience. This led the researcher to consider adding questions on the survey about the nature of video content access that learners from India might have. Next, in their experiences, while a considerable amount of what participants shared matched existing studies on MOOC learner experiences (Christensen et al., 2013; Veletsianos et al., 2015), a factor that emerged as potentially being part of the Indian learning experience related to the perceived 'prestigious' status, of both the institution offering the MOOC, as well as the instructor conducting the MOOC. Lastly, participants identified forums as being too time-consuming and overwhelming for their purposes, preferring instead to use familiar WhatsApp spaces to discuss course-related materials.

Apart from identifying these themes that helped in the design of the survey instrument, the pilot interview process was useful in helping the researcher focus on his own interviewing skills, on being able to manage the technical aspects of using Skype to call learners on their phones in India and having everything be recorded and transcribed in an orderly fashion. While some of the interviews had awkward pauses, interruptions from the interviewer, and the occasional leading question, these issues were identified during the transcription process, and active measures were taken to ensure that these same issues did not occur in the Phase 3 interviews.

4.3.2 Phase Two: Survey

Based on the findings from the pilot interviews, coupled with existing questionnaires from a number of studies on learners in MOOCs (Christensen et al., 2013; Ho et al., 2015; Nesterko et al., 2013) and OER (de los Arcos, Farrow, Perryman, Pitt, & Weller, 2014), a survey instrument was designed. This section discusses the various decisions made in the design of the survey and the methods by which the participants were contacted to participate in the study.

4.3.2.1 Participant Recruitment

Unlike the pilot interview recruitment process, which had a number of challenges in getting access to participants, for the delivery of the survey to the broadest possible number of participants, agreements were made with the two platforms of NPTEL and FutureLearn, to share an invitation to complete the survey. It should be noted that while both NPTEL and FutureLearn were interested in the findings of this study, they had no bearing on the design, interpretation and reporting of its findings. The ethical implications of this are discussed in **Section 4.4**. Participants were recruited for this study through two different methods on FutureLearn and NPTEL.

On FutureLearn, users are able to manually check a box on their profiles that state that they are willing to be contacted to participate in any research study that might be conducted on their usage of the platform. 1865 users that were geographically identified as

being from India on their 'more about you'[16] profiles had checked that box. An invitation to participate in the research study (**See Appendix 3**) was sent to these learners, via email, directly from FutureLearn on behalf of the researcher in this study. This eventually led to 364 survey responses from Indian learners on FutureLearn, an approximate 18% response rate.

On NPTEL, however, a direct link to the survey was posted on the official "Featured News" bulletin on the front page of the website and featured prominently on the front page for a period of at least 3 months. While it is not possible to judge exactly how many people would have viewed the listing, and hence it is impractical to estimate a response rate from the NPTEL sample, this prominent display of a link to the survey for such an extended period of time, coupled with NPTEL being a platform primarily for Indian learners, is likely to have contributed towards the final count of 2009 survey responses from NPTEL.

4.3.2.2 Designing for Greater Response Rates

The goal of the survey was to elicit responses from as wide a range of MOOC participants as possible. As a research method, web surveys have an inherent advantage of being able to reach a wide range of participants and collect large amounts of data, at a fraction of the time and cost it would take through traditional means (Wright, 2006). The population of Indian MOOC learners is likely not to be limited to a certain geographical area, and there was a need to use a research design that is as accessible to the target population as possible. While web-based research has the disadvantage of missing those without access (Wright, 2006), as the population being studied are learners who have enrolled in an online course, it could be assumed that potential participants will not be completely lacking in access to the internet.

In order to encourage adequate response rates, a number of factors were relevant to the survey design. In India, only a handful of elite universities based in the major cities have vibrant academic research cultures in the social sciences (South Asia Research Hub, 2011, p. 19). Therefore, there is potentially a lack of awareness about the types of research being

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[16] Source: <https://www.futurelearn.com/user/more-about-you>

conducted and the potential benefits of contributing to social science research. These factors, among others, have been shown to reduce response rates in surveys (Groves, Cialdini, & Couper, 1992).

A number of meta-analyses of survey response rates have identified high salience (i.e., topic being of great interest to participants) as being one of the most essential factors in determining response rates (Fan & Yan, 2010). For this reason, a number of sentences were used, in both the survey invitation as well as the information page of the survey **(See Appendix 4),** to elicit emotional responses from participants that might, in turn, increase the perceived salience of the topic of the survey. These sentences include, for instance, in the first paragraph of the information page of the survey:

> The goal of this research is to outline what role these free online resources could play **in improving the state of higher education and increasing access to education in our country.**

By repeatedly drawing attention to the potential social good of the study, it was hoped that participants might be further inspired to participate in the study. An incentive was also used in order to increase response rates, in the form of a lottery for five Amazon online shopping vouchers of Rupees 2000 value (Approximately £20). The use of incentives in web surveys is a controversial topic, and a meta-analysis of the effect of incentives on response rates has shown mixed findings, with most studies suggesting only a modest improvement in responses (Fan & Yan, 2010). However, studies on college-level participants have found a marked increase in response rates through the provision of a lottery-based incentive (Laguilles, Williams, & Saunders, 2010). As it was anticipated that potential participants are likely to be of a younger age, the perceived value of an Amazon voucher of relatively significant value is likely to have had a positive effect on response rates.

4.3.2.3 Survey Language

Studies have shown that shorter surveys (Fan & Yan, 2010; Galesic & Bosnjak, 2009) tend to have higher response rates. For this reason, the survey was purposefully designed to take no longer than five to seven minutes to complete. Initially, the researcher considered delivering the survey in both English and Hindi. However, as MOOCs were currently only available in English, it was assumed that the population would have at least a working

knowledge of the English language. While not localising the survey to Hindi might marginalise participants that struggle with English, translating the survey only in Hindi would alienate many Southern Indian states, where Hindi is not spoken, and translating the survey into all 22 officially scheduled languages in India[17] would not be feasible for a study of this size. Hence, the questions were designed to be easy to comprehend, and at the same time, followed survey design best practices of avoiding bias and vagueness (Fan & Yan, 2010).

4.3.2.4 Survey Design

A complete version of the final survey, as it appeared on the SurveyMonkey platform, can be found in **Appendix 4**. This section outlines the design decisions taken when creating the survey instrument.

As discussed in the previous section, the aim of delivering the survey instrument through the NPTEL and FutureLearn platforms was to appeal to as wide a range of participants as possible. There have been a number of studies showing how preceding questions can affect how respondents consider and evaluate later questions (Fan & Yan, 2010) . Further, the placement of demographic information at the start or end of the survey is another contested topic. A study by Teclaw, Price and Osatuke (2011) showed that demographic information collected at the beginning of a survey leads to higher response rates than demographic information collected at the end. This is likely to be due to the perceived ease of answering demographic questions at the beginning, as well as getting the participants *invested* in their response, making them more likely to complete the survey. Conversely, leaving the important, analytical questions to the end of the survey risks participants being fatigued and not entirely engaging with their responses. Studies have shown that the further in a survey one gets, the faster, shorter, and more uniform the answers get, compared with the answers to questions asked near the beginning (Bogen, 1996; Galesic & Bosnjak, 2009).

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[17] Source: https://en.wikipedia.org/wiki/Languages_of_India Retrieved May 2, 2019

As there were valid arguments on both perspectives, the research questions of this study were consulted to determine which level of data collection would be presented first - the demographic questions or the Likert-type items on motivations, experiences and challenges. The primary purpose of this survey was to gather demographic information on Indian learners, while responses on learners' perceptions of their motivations and experiences could be captured at greater depth through qualitative interviews. As information about demographics was of greater importance at this stage of the study, it was decided to gather that information at the beginning of the survey.

The demographic information collected for this study included gender, age, location, as well as employment and educational status. These are the standard fields collected in existing MOOC studies (Christensen et al., 2013; Ho et al., 2015; Nesterko et al., 2013), and would help in answering the research question by providing a point of comparison between the Indian context and global studies. Language is important to the Indian context, as participants could have completed their education in a non-English medium. The current study investigates the extent to which these learners represent the early adopters of MOOCs in India. Language could potentially have a significant role to play in the broader adoption of MOOCs in India, particularly within a development context, and therefore, questions related to language proficiency are included as part of the demographics.

The survey then asked participants to select from a list of MOOC providers, those they are aware of, as well as those they are enrolled on. This list is exhaustive [**See Appendix 4**], with a number of international as well as Indian MOOC platforms. The list also contains non-MOOC learning providers such as MIT-Open Courseware, iTunes U and Khan Academy, among others. This serves two purposes. It first determines participants' awareness of Indian and Global MOOC platforms, but it also suggests which are the popular online learning platforms in India. A (free text) "Other" box was also provided for participants to suggest any additional platforms they have enrolled on.

The next section of the survey explores the participants' patterns of engagement with MOOCs, including the number of courses they have enrolled in and completed. This provides an understanding of how active these learners are in MOOCs, and what per cent of survey respondents have completed MOOCs, and to what extent. Further, the survey

also asked learners if they have paid for any premium service (Certification, Proctored examination etc). One aim was to investigate whether, in the Indian context, there appears to be a relationship between the number of courses completed, and the likelihood of spending money on a MOOC certificate, particularly in light of the Economic Realities of MOOCs as outlined in **Section 2.2.2**.

4.3.2.5 Use of Likert-type Items

In order to gauge learner attitudes towards their motivations, experiences and challenges, 5-point Likert-type items were used in the survey.

There is considerable debate about the effectiveness of various scale lengths on the reliability of responses from participants. Some have argued that a three-point scale is sufficient (Jacoby & Matell, 1972), others have found that means remain constant between 5-point and 7-point scales (Dawes, 2008), while others have argued for greater lengths all the way up to 21-point scales (Pearse, 2011). It has been observed that as the granularity of the scale increases, the number of neutral responses decreases. However, the greater number of options on the scale increases the cognitive load required to assess their position, and the linguistic differentiation between the numbers get more complex and likely harder to comprehend (ibid. p. 163).

Cultural factors can also influence participant response to Likert-items, with a study finding that Chinese and Japanese respondents were more likely to select the neutral option on items that involved admitting positive emotion than were American respondents (Lee, Jones, Mineyama, & Zhang, 2002, p. 295). Further, Jacoby and Mattell (1972, p. 506) argue that while having a neutral point is "sometimes considered inadvisable because it provides too easy and attractive an escape for respondents who are disinclined to express a definitive view. On the other, forcing responses into an agree or disagree format is likely to cause difficulty for many respondents.". Furthermore, a study found considerable differences between the survey response and free text accounts in cases of socially disadvantaged respondents (Ogden & Lo, 2012). The mixed methods design of this study did allow a comparison between the survey responses and interview data to highlight where any considerable variances occurred, and what the reasons behind these apparent discrepancies might be.

For these reasons, a 5-point length was chosen to be appropriate for this study, to minimise time spent on each item, while allowing respondents to provide neutral responses if they desired.

The survey included seven Likert-type items related to learner motivations to enrol in MOOCs, sixteen Likert-type items related to learners' experiences and motivation during the MOOC, and lastly, nine Likert-type items about challenges learners may have encountered during the MOOC.

Many of the Likert-type items in the survey were adapted from the OER Research Hub Survey (Farrow, Perryman, de los Arcos, Weller, & Pitt, 2016, p. 61). The OER Research Hub, based at the Open University in the UK, was a three-year project that investigated several hypotheses on some common perceptions about the benefits of OER. The study, which surveyed over 6000 learners and educators about their perceptions of OER across the world, had many commonalities with some of the claims made about MOOCs. Of specific interest to this study was the hypotheses on Access: "Open Education models lead to more equitable access to education, serving a broader base of learners than traditional education" (de los Arcos et al., 2014). This particular finding resulted in similar findings to MOOC research, as outlined in **Section 3.1**, with most users of OERs being already educated. However, the opportunity to learn at no cost was considered of significant importance to 88.4% of all survey respondents, and amongst respondents already in formal studies, 52.7% indicated they used OER to supplement their formal studies (ibid. p.18). Beyond the findings of the survey, the OER Research Hub released their Research Instruments and Datasets on an Open License (Farrow et al., 2016). As this instrument was already tested and refined through over 6000 responses, this study chose to borrow from some of the Likert-type items asked in this study. Further, these items were combined with the findings from the pilot interviews, as well as the key themes emerging from the MOOC literature relevant to the three themes of this study, to devise contextually appropriate Likert-type items

The first set of Likert-items, asked participants to rate their motivations for taking a MOOC, adapting six Likert-type items from the OER Research Hub Survey while adding the statement "To assist in my formal studies" as a factor based on findings from the pilot

interviews, as well as from the wider role NPTEL, in particular, had taken on in the formal higher education space since the pilot interviews.

The next section of the survey asked participants to rate how important sixteen factors were to their MOOC experience. This section contained a number of factors that emerged from the pilot study, such as 'Videos being subtitled', 'Being able to slow and speed up video lectures', 'Being able to download course content to my personal device', 'transcripts being provided for videos and slides', 'The course being from a prestigious university', and 'Opportunities for interaction with the instructor'. Other factors were adapted from the OER Hub Survey, including 'Being able to improve my study skills' , 'Being able to study the course online', 'Being able to try university-level content for free before signing up for a formal course', 'Being able to study at no cost' and 'Being able to access the materials at any time' (Farrow et al., 2016, p. 72). The final factors were influenced by the key themes that emerged out of the literature around MOOCs and the learner experience at the time, regarding perceived quality of the MOOC (Conole, 2013), the role of assessment (Ebben & Murphy, 2014), and interaction with other learners and social learning in MOOCs (Ferguson & Sharples, 2014).

The final section asked learners to what extent they agreed or disagreed with statements regarding the challenges they faced in MOOCs. These challenges were broadly split into technical challenges and course difficulty related challenges, few of which emerged out of the findings of the pilot study, and challenges related to finding discussion forums overwhelming – emerging out of the literature on connectivist MOOCs and the apprehension of learners to engage in social learning (Kop et al., 2011; Stanford University, 2013), difficulty understanding the accent of instructors due to perceived language barriers, and lastly, related to insufficient contact with course instructors/tutors (Haavind & Sistek-Chandler, 2015).

In summary, the survey was designed to begin with questions about learner demographics and patterns of engagement with MOOCs, adapted from existing several studies on MOOC learners (Christensen et al., 2013; Ho et al., 2015; Nesterko et al., 2013). This was followed by Likert-type items on leaners' motivations to take a MOOC, adapted from the OER Hub Survey (Farrow et al., 2016), as well as items on learner experiences that further drew from

some of the key themes of literature around MOOCs (Conole, 2013; Ebben & Murphy, 2014; Ferguson & Sharples, 2014), and lastly, Likert-type items on challenges faced by learners, based on the pilot study findings, as well as around crucial issues such as social learning (Kop et al., 2011; Stanford University, 2013) and instructor presence (Haavind & Sistek-Chandler, 2015). The survey was distributed on the SurveyMonkey platform and was designed to take participants five to seven minutes to complete.

4.3.2.6 Piloting the Survey

After the survey was designed, it was piloted amongst a group of PhD researchers within the Institute of Educational Technology at The Open University (n=10), who provided feedback on various design elements of the survey that could potentially be improved upon.

On average, the participants spent six minutes completing the survey, which some raised as a concern as potentially being too long. However, as the design had anticipated completion time of 5-7 minutes, the six-minute average was considered fair. While two of the participants felt they struggled on some of the later questions in the survey, this is likely to be due to their lack of knowledge about MOOCs and was not anticipated to be an issue with the target population.

The information sheet at the start of the survey was brought up as being too lengthy and potentially time-consuming and daunting to prospective survey respondents. The page was later tidied up and formatted in a way in which crucial information was emboldened and highlighted, allowing for respondents to not necessarily get intimidated by a large amount of text.

Lastly, there was feedback given on the visual design of the Likert-type items on the survey platform, and after consideration, minor changes were made in the visual appearance of those questions, with appropriate breaks in pages, allowing respondents to have time to acknowledge the ending of one section of the survey, and the beginning of another.

4.3.2.7 Treatment of Missing Data

Missing data is one of the most common problems that face survey-based research, more so in a web-based environment (Tsikriktsis, 2005). A decision was made at the design stage

not to make the filling of any data compulsory, as learners may not wish to report on some of these factors or might drop out of the survey at some point, but still provide useful data to the study.

While the analysis of missing data does have a negative impact on the statistical power of some of the claims being made (Roth, Switzer, & Switzer, 1999), the outright listwise deletion of any incomplete survey response can lead to significant loss of valuable data that could otherwise be useful (Tsikriktsis, 2005, p. 56). As has already been stressed, the purpose of the quantitative data in this study was not to make generalisations about the entire population of Indian MOOC learners, but rather, to make better sense of the qualitative data gathered through the interviews, and to generate a holistic view of some of the authentic accounts of Indian learners on NPTEL and FutureLearn, through the mixed-methods triangulation of data.

Also, this study did not make correlations between individual demographic variables and the Likert-type items, as the research questions were intended to be a comparison of the responses from the NPTEL and FutureLearn sample, and due to the potentially biased sample, any inferential findings would likely be of low statistical power. Lastly, the decision was made to report and compare each Likert-item individually, rather than creating composite Likert scales by combining multiple Likert-type items into constructs. As the study was not measuring particular personality traits that are better suited to composite Likert scales (Boone & Boone, 2012), a comparison of learners' attitudes per Likert-item allowed for a more granular analysis of the survey data, and revealed nuances that may not have emerged if composite scales were used.

For these reasons, instead of listwise deletion of responses where missing values were found in some variables, each Likert-type item was reported along with the number of responses and percentage of missing values.

4.3.2.8 Survey Analysis

This section outlines the various steps taken in the analysis of the survey data. Once the survey was closed, the raw dataset was downloaded from the SurveyMonkey platform and imported into IBM SPSS Version 23 for quantitative analysis. From then on, the following steps were taken to prepare the data for analysis.

First, each variable and string in the data was cross-checked with the survey design and renamed where necessary to allow for easier comprehension during analysis. Next, the 'Challenge' related variables, which were posed as negative questions, were re-coded and had their polarity reversed, with the most negative sentiment coded with the value of '1' and the most positive sentiment coded with the value of '5'. This was intended to allow for easier analysis, with values matching those in preceding sections. Finally, the individual age variables were coded into specific age-brackets, adopting the age-brackets officially used by FutureLearn, in order to make for easier comparison.

Using the Descriptive Statistics function in SPSS, frequencies of the various demographic and MOOC behaviour variables were outputted as a comparison between the two platforms of NPTEL and FutureLearn. The descriptive statistics of each demographic variable are reported in the findings (See **Section 5.1.1**) along with the missing values for each.

For the Likert-type items, a decision had to be taken about whether to treat the scales at the ordinal or interval level[18], as that would determine whether parametric or non-parametric tests could be applied to the data. There is considerable debate on whether Likert-type items should be treated as ordinal or interval measurements (Ingram & Ternes, 2018). Meanwhile, Boone and Boone (2012, p. 208) address the sorts of measurement needed between Likert-type items and Likert-type scales. They assert that Likert-type items are singular statements and measured on an individual level, while a Likert-type scale is one that is composed of four or more Likert-type items that are combined into a

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[18] Ordinal measurement only considers the relative position, or rank, in a given order, while interval measurement implies that there is an equal distance between positions.

composite scale/variable. They go on to argue that while Likert-type scales can be treated as interval level of measurements, Likert-type items should be treated at an ordinal level, sentiments that are shared by Brown (2011) and Cliff and Keats (2003).

Treating Likert-type items as interval measurements allows for more advanced parametric testing, such as the student t test, one-way analyses of variance (ANOVA), multivariate ANOVAs and more (Nunnally & Bernstein, 1994), and, in fact, numerous social scientists that conduct survey research do treat Likert-items as interval data (J. D. Brown, 2011, p. 11), but this implies that the measurement is continuous, with each number being equidistant from the next, despite being participant perceived abstract notions such as 'importance' and 'agreement', that don't necessarily follow a linear scale.

For this reason, a compromise was reached in the analysis of the quantitative data. While standard descriptive statistics would be used (such as Means and Standard Deviation) to describe the central tendencies of the Likert-items, for purposes of further comparative analysis, the items would be treated as Ordinal in nature, and as such, would not be considered for further parametric testing, using non-parametric testing to check for differences between the two samples. This allowed for a meaningful discussion and comparison of the responses of the two platforms, which then formed the basis of the analysis of the qualitative findings from the interviews.

When taking such a position, Brown (2011, p.13) suggests

> If a researcher presents the means and standard deviations (interval scale statistics) for individual Likert items, he/she should also present the percent or frequency of people who selected each option (a nominal scale statistic) and let the reader decide how to interpret the results at the Likert-item level.

For this purpose, frequencies of each Likert-item were reported as comparative histograms in the Appendices.

Despite choosing to recognise the Likert-items as Ordinal and not Interval data, there was still a need to test for normality, to confirm whether non-parametric testing is appropriate to check for differences in the two groups of responses. The non-parametric Kolmogorov-

Smirnov (K-S) and Shapiro-Wilk tests were conducted on each Likert-item to check whether the responses followed a normal distribution or not.

The Shapiro-Wilk test is one of the most popular nongraphical tests for normality but lacks fidelity at higher sample sizes (Mecklin, 2011, p. 885). To account for this weakness, and to confirm the distribution of the sample, the Kolmogorov-Smirnov (K-S) test was also used to determine whether the distribution that is observed matches that of a theoretical normal distribution (Huizingh, 2012, p. 329). As is outlined in **Section 5.1.2, 5.1.3**, and **5.1.4**, all of the Likert-type items tested were shown not to follow a normal distribution. Hence, the usage of non-parametric statistical methods to compare the NPTEL and FutureLearn responses was validated.

In order to check for differences in two non-parametric independent samples, as was the case between the NPTEL and FutureLearn survey responses, the non-parametric Mann-Whitney U-Test was considered appropriate. The U statistic generated by this test "measures the tendency for observations in one of the two populations to be larger (or smaller) when paired randomly with observations in the other population" (Richardson, 2018, p. 1007). While the Mann-Whitney U Test, and nonparametric test, in general, tend to be less powerful than their corresponding parametric test (In this case, the student *t*-test), a test of comparative power-efficiency of the tests found that the Mann-Whitney U-ttest in comparison with the t-test for independent samples reached a value of 95.5% comparative power (Mood, 1954; Richardson, 2018). Hence, the Mann-Whitney U-test can safely be employed in comparing two independent groups that do not follow a normal distribution, and therefore was chosen to compare the responses of the NPTEL and FutureLearn sample on the Likert-type items.

4.3.3 Phase Three: Interviews

Following the collection of survey data, semi-structured interviews were conducted with thirty participants, fifteen from the NPTEL sample, and fifteen from the FutureLearn sample. This section discusses the sampling, design, and analysis methods that were chosen in this phase of the research study.

4.3.3.1 Participant Recruitment

After the completion of the survey, there was an optional prompt at the end for respondents who wished to participate in follow-up interviews to provide their email address. There was an added incentive provided in five additional Rs. 2000 (Approximately £20) Amazon online gift vouchers to those who participated, in order to generate a pool of sufficient respondents to select interview subjects from. 41.6% (n=836) of NPTEL and 47.8% (n=174) of FutureLearn respondents indicated they would like to participate in follow-up interviews.

When determining an appropriate sample size of interviewed participants for any qualitative analysis, often the notion of data 'saturation' is considered as an end point, that is, when no new insights can be gained from gathering more data (Ritchie & Lewis, 2003, p. 80). There are numerous factors that determine when data saturation is reached in qualitative research, and how adequate sample sizes can be determined (Charmaz, 2006), and the very notion of 'saturation' has been argued as being problematic (Dey, 1999) and often ill-conceived by novice researchers, who may inadvertently guide participants towards 'saturation' through their own biases and worldviews (Fusch & Ness, 2015, p. 1411).

Analysis of the survey demographic data demonstrated that there were considerable differences in the demographics of the FutureLearn and NPTEL sample, and there were considerable differences in the demographics within the FutureLearn sample itself, while the NPTEL sample of respondents tended to be relatively homogenous. While female representation was already quite limited in the NPTEL sample (See **Section 5.1.1**), special efforts were made to recruit female NPTEL respondents that had completed the survey and expressed their willingness to be contacted for further interviews. However, despite efforts from the researcher, none of the female NPTEL respondents responded to the invitational email, and hence could not be interviewed. The lack of female representation in the qualitative analysis of the NPTEL sample of learners is a noted limitation of this study.

Sample size is often controlled by the levels of claims the study aims to make, and theory the study wishes to generate. As Charmaz (2006, p. 114) suggests, "Researchers who make hefty claims should be circumspect about the thoroughness of their data and the rigor of their analyses. A study of 25 interviews may suffice for certain small projects but invites

skepticism when the author's claims are about, say, human nature or contradict established research". Further, Mason (2010) argued that if saturation is the guiding principle behind the qualitative data collection, then this could be achieved at any arbitrary number, not necessarily one that ends in zero. However, his analysis of 560 PhD theses found that more often than not, a round number was chosen as the sample size (ibid., p. 157)

Hence, while the limitations and usefulness of strict notions of saturation are recognised, given the scale of the study, and the time constraints of conducting and transcribing interviews, a pragmatic decision was made to recruit 15 participants from each platform, for a total of 30 interviews.

In order to select respondents for interviews, first, an important decision had to be made between random/probability sampling or purposive sampling. There are numerous statistical methods of stratifying and generating a probability sample – where every element has a known, non-zero chance of being selected through a random, but known, procedure (Czaja & Blair, 2011). However, there are cases where probabilistic random sampling may not be suitable. As Czaja and Blair (2011, p. 130) argue "Not every research study is designed to estimate some characteristic of or generalise to a population. In an exploratory study, a researcher may only want to get a sense of what respondents are thinking, believe, or feel about a topic."

The main limitation of non-probabilistic sampling is the subjective nature of the sampling. Given each researcher would have different samples that could potentially lead to differing results, such methods are usually recommended only when generalisability to a broader population is not the explicit goal of the study (Battaglia, 2011), as was the case in this study.

A quota sampling technique (Blasius & Brandt, 2013) was considered, across the three demographic variables of age, gender and education level. There were seven age brackets, two gender brackets and seven education level brackets constructed, into a matrix of 98 differing cells. This form of sampling was considered unfeasible for this study, as there were some cells without adequate cases to select from. More importantly, quota sampling is only preferable when the population census is known and can be accurately represented through the pool of respondents (Blasius & Brandt, 2013). In the case of this study, it is unclear how representative the pool of survey respondents are of the entire population

(Indian MOOC learners), and, as will be discussed in the findings, were likely a biased sample of active, MOOC-completing learners that do not represent the average MOOC learner. A preliminary analysis of the survey data suggested that males between 18-24 were overrepresented in the data – likely due to the orientation of NPTEL towards formal engineering students. However, it was unclear whether traditionally lesser represented groups in online surveys such as women and the elderly were adequately represented in the data.

As an exploratory study, one of the main aims was to get a broader sense of the types of profiles of learners and their authentic experiences with MOOCs in India. The study was not necessarily meant to be a statistically accurate representation of Indian MOOC learners, but rather provide insight for potential future, more in-depth study of the context. For this reason, a purposive sample of survey respondents was chosen to reflect a richer, rather than a statistically representative variety of perspectives and experiences. A combination of purposive sampling techniques – typical case sampling, where the researcher identifies cases that best represent a typical case, and extreme case sampling, where the researcher identifies cases at the extremes to sample (Palinkas et al., 2015, p. 540), was used to recruit participants for further interview, to get a broader sense of the differing, and similar profiles of learners on the two platforms.

Participants were contacted in batches of five, as many of those who indicated they wished to participate in interviews later backed out or did not respond to the invitational email (See **Appendix 5**). In order to anonymise the participants' identities, they were each assigned a code represented by their order in the interviews conducted, and the platform from which they were recruited from. For instance, participant1_FL was a FutureLearn respondent, while participant30_NPTEL was an NPTEL respondent. Once fifteen interviews were collected from both platforms, further recruitment was stopped. **Appendix 6** shows brief profiles of each of the thirty participants interviewed in this study.

4.3.3.2 Interview Design

The interview was structured around Research Questions 1(b) and 1(c), focusing on the two themes of learner motivations and learner experiences. A detailed interview schedule, as

well as information about the various studies from which some of the questions asked were adapted, is included in **Appendix 7**.

The interviews began with the researcher introducing himself to the participant, informing them of the purpose of the study being conducted, and establishing rapport with each participant by asking them to 'tell me a bit about yourself', and leading the conversation based on the responses of the participants. Particular effort was taken to ensure each participant was comfortable and a good 'working relationship' was achieved, "where the researcher seeks to put the participant at ease" and creates "a climate of trust" (Ritchie & Lewis, 2003, p. 143).

This was particularly challenging in the case of some NPTEL participants, as they were of the belief that the researcher was a representative from the NPTEL platform, and that somehow their participation in the interview was going to have some bearing on their standing on the platform. This misunderstanding likely stemmed from the survey being directly shared on the NPTEL frontpage, rather than through an invitational email sent out to FutureLearn participants. This led, in some cases, to the interviewed participants exaggerating how much they liked the NPTEL platform, with statements such as "you are doing a great job with NPTEL". The interviewer had to, in these cases, remind the participants that he was an external researcher from The Open University in the UK, and not in any way associated with NPTEL and that their responses would be anonymised and not shared directly with anyone from the platform. Such statements that shared undue praise of the NPTEL platform were noted and appropriately weighted in the coding stage of the analysis.

Once adequate rapport was built, and background questions about their personal circumstances and awareness of MOOCs completed, open-ended questions about what led the participants to sign up for the MOOC, and what made them persist were asked. Participants were further asked about their usage patterns of MOOCs, and the ways in which they might regulate and structure their learning on a typical course. These questions were directly related to Research Question 1(b) and the theme of learner motivation in MOOCs.

Next, participants were asked what they liked the most and least about the course. While specific elements of the MOOC (Videos, assessment, discussion forums) were not directly mentioned, in hindsight, individual questions about each of these elements of the course could have been asked instead to understand their perceptions of each of these individual course elements to their learning experience. The rationale for not asking about individual elements was not to pre-empt their responses with leading questions that might bias their responses (Ritchie & Lewis, 2003, p. 154), and allow for participants to reflect and respond with their own beliefs, but in four of the NPTEL interviews, this question was considered too ambiguous by the participants, and the researcher had to elaborate on the various aspects of the course that learners might have liked or disliked, which may have biased their response.

Based on the findings of the pilot interviews, and Research Question 1(c) and the theme of learner experiences in MOOCs, participants were asked to compare their experiences learning on the MOOC with learning at their own institution. If learners had taken Indian and Western MOOCs, they were asked to compare their experiences on the two, and how taking MOOCs has impacted on their lives. These questions allowed participants to reflect on their own experiences and generated some of the richest responses and discussion from the participants. The questions often led to varied responses that highlighted some of the nuanced views participants had about their experiences with MOOCs.

Lastly, the interview ended with a broader question, not directly related to any research question, but more generally, about what role courses such as the one's participants took on FutureLearn and NPTEL could play in the Indian context. This allowed participants to step out of their own personal experience and speak more broadly about the perceived strengths and weaknesses of MOOCs. In some cases, this led to a heated discussion about the role of MOOCs in India and was a valuable addition to the interview schedule.

To summarise, the interviews asked a series of questions on the themes of learner motivation and learner experiences in MOOCs, that added rich qualitative data to this study. While there were some challenges, with some participants from the NPTEL sample misunderstanding the role of the researcher, and though one or two questions were considered ambiguous by these respondents, the interviews generated considerable data,

that, when mixed with the quantitative findings of the survey responses, provided valuable insight on Indian learner motivations and experiences on MOOCs, and lead to a richer and more detailed comparison between the two learner populations of NPTEL and FutureLearn learners.

4.3.3.3 Data Collection

The interviews were conducted, as with the pilot interviews, over the phone, with the researcher using Skype on his end. This allowed for more accessible recordings using the Amolto Call Recorder application for Skype, which recorded interviews and saved them as mp3 files on the researcher's system. The use of Skype as a method of conducting interviews has been growing at a considerable rate as Voice Over Internet Protocol (VOIP) services and web-based research become more ubiquitous (Bertrand & Bourdeau, 2010; Hanna, 2012). While there are limitations to using Skype, such as connectivity issues and unreliable internet access leading to call-drops or poor-quality audio recording, especially in a developing context such as India, this was alleviated by calling the participants through Skype on their mobile phones, on a stable Fibre connection from the UK. This led to minimal audio degradation and problems communicating with participants, except in the case of one of the interviewees, who happened to be in a moving vehicle at the time the interview was being conducted, which led to the call occasionally dropping out.

While in-person interviews have been shown to yield better quality data (Shuy, 2003), with fewer biases compared to phone interviews (S. Knox & Burkard, 2009, p. 570), such an approach would be unfeasible for this study as the participants are geographically spread across India, while the researcher was based in the United Kingdom. Further, asynchronous email-based interviews were also considered to be offered to participants. Such interviews have a number of benefits over synchronous phone-based interviews – for example, in allowing researchers to reflect and form more structured responses to the questions compared with face-to-face interviews, and some of the respondents may feel more comfortable responding in writing rather than speaking (Ratislavová & Ratislav, 2014, p. 454) However, the asynchronous nature of email-based interviews would also lead to challenges. As email correspondence would be in a second language for most respondents, there could be the possibility that the responses would be short and not detailed enough,

or potentially considered too time-consuming for some respondents. More importantly, as an exploratory study, the interview schedule was incredibly fluid, and the direction of the interviews was to be guided by the responses of the participants. This would not be ideal in an asynchronous format; hence, the interviews were not conducted via email.

4.3.3.4 Transcription

Once all thirty interviews were completed, the transcription process began. Mergenthaler and Stinson (1992, p. 129) provides seven principles as guides towards the transcription process:

1. *Preserve morphologic naturalness of transcription*. The graphemic presentation of word forms, the form of commentaries, and the use of punctuation should be as similar as possible to the presentation and use generally accepted in written text.

2. *Preserve naturalness of the transcript structure*. The printed format should be as similar as possible to what is generally accepted, like the printed versions of radio plays or movie scripts. The text must be clearly structured by speech markers.

3. *The transcript should be an exact reproduction*. The loss of information resulting from the transition from a visual and/or acoustic to a written record of the interview should be as small as possible. A transcript should not be prematurely reduced but should be kept as a raw data form

4. *The transcription rules should be universal*. The rules governing transcription should, as much as possible, make the transcripts suitable for both human and machine use.

5. *The transcription rules should be complete*. It should be possible for the transcriber to prepare transcripts using only these rules based on his or her everyday language competence. Specific knowledge, such as codings stemming from various linguistic theories, should not be required.

6. *The transcription rules should be independent.* It should be possible to transcribe various kinds of therapeutic discourse with the same set of rules. Transcription standards should be independent of the transcriber, understandable and applicable by secretaries and scientists.

7. *The transcription rules should be intellectually elegant*; The transcription rules must be limited in number, simple, and easy to learn.

These principles served as guidelines for the transcription process, but particular adaptations were made to fit the Indian context. As English was not the primary language of communication for most of the respondents, many of the responses of the participants

were grammatically incorrect when transcribed. While they made sense to the researcher who hails from the same country who could understand many of the *Indianisms* of their speech, they would make little sense if transcribed verbatim to an international audience. This form of 'non-native spontaneous speech' has been shown to have error rates that can be higher than 30% in some transcriptions (Zechner, 2009, p. 28).

In arguing against the need for verbatim transcription, Halcomb and Davidson (2006, p. 40) mention, "Considering that the process of transcription should be more about interpretation and generation of meanings from the data rather than being a simple clerical task, the need for verbatim transcription in every research project that generates verbal interview data must be questioned.". Hence, a flexible approach towards transcription was taken, where responses were restructured to sound grammatically correct, while taking every precaution to ensure that the implied meaning behind the words would not be affected. Similarly, whenever an excerpt included in the thesis used terminology unique to the Indian context, a box bracket translation was used to explain the term for an international readership.

Once transcribed, the interviews were imported into the Dedoose application for analysis. Dedoose was chosen over standard commercial software like Nvivo for a number of reasons. First, the application ran out of the browser, requiring no need to download any additional software. Next, as a browser-based application, it allowed for real-time collaboration with, in this case, the supervisors of the project, for reliability checking purposes. Lastly, it was offered at a flexible monthly subscription cost that was more economically suitable than the Nvivo license. While most Computer Assisted Qualitative Data Analysis Software (CAQDAS) have a similar level of features, they primarily afforded the researcher a considerable amount of convenience when dealing with such a large corpus of data. Of particular note, the ability to query the entire corpus for particular phrases, colour code different levels of coding, and give preferential weight to different codes played an important role in simplifying the qualitative analysis process.

4.3.3.5 Thematic Analysis

For the purpose of this study, an inductive thematic analysis approach was taken to analyse the qualitative data from the interviews, and this section outlines the decisions taken in determining this approach, as outlined by Braun and Clarke (2006).

Initially, a grounded theory approach as posited by Charmaz (2006) was considered as a framework to shape the analysis of the qualitative data. However, as Braun and Clarke (2006, p. 85) suggest:

> Grounded theory seems increasingly to be used in a way that is essentially grounded theory 'lite' - as a set of procedures for coding data very much akin to thematic analysis. Such analyses do not appear to fully subscribe to the theoretical commitments of a 'full fat' grounded theory, which requires analysis to be directed towards theory development

Indeed, once the research questions were considered, the aim of this study was not the development of a new theory of learning for Indian MOOC participants, but rather, an exploratory analysis of the various profiles of learners that take MOOCs from the two platforms in this study, and a rich understanding of their motivations and experiences with MOOC-based learning. Hence, a grounded theory approach was considered inappropriate for this study.

There are two main benefits to using a thematic analysis approach to analyzing qualitative data, namely, accessibility and flexibility (Braun & Clarke, 2012, p. 58). Thematic analysis provides a natural access point to qualitative research, with a focus on data analysis that is not bound by the usual broader theoretical confines within which qualitative researchers tend to bind themselves to. This view of research fits well within the broader pragmatic approach, as described in **Section 4.1**. Further, the flexibility of thematic analysis allows researchers to pick whether they wish to analyse their data inductively, or deductively[19], based on their research questions and theoretical assumptions, while some have also used

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[19] Inductive analysis looks for patterns and connections derived from observations, while deductive analysis generates hypotheses and tests them through observation (Ritchie & Lewis, 2003, p. 23).

hybrid-approaches to thematic analysis (Fereday & Muir-Cochrane, 2006; Swain, 2018), by combining the two aforementioned forms of reasoning to aid their analysis.

When considering the exploratory nature of this study, an inductive approach to qualitative analysis was initially considered appropriate (Vaismoradi, Turunen, & Bondas, 2013, p. 401), as deductive approaches are better suited to test existing hypotheses in different situations. With that being said, while inductive analysis does imply a bottom-up approach where the researcher codes the data outside any existing analytical preconceptions they may hold, in actuality, "researchers cannot free themselves of their theoretical and epistemological commitments, and data are not coded in an epistemological vacuum" (Braun & Clarke, 2006, p. 89). Further, as a mixed-methods study, the interviews were already influenced by the preceding phases of data collection and analysis, which, in turn, were guided by the research questions. Hence, a hybrid approach to thematic analysis, as posited by Swain (2018) was adapted for this study, with the codes being generated inductively, and the themes deduced from the preceding analyses and the research questions of the study.

The themes generated from the qualitative data were analysed at an interpretive level, rather than a semantic level (Boyatzis, 1998). It was considered important to go beyond a surface level analysis of the themes generated and to dig deeper into understanding what these themes represent about the learner motivations and experiences of Indian learners on FutureLearn and NPTEL. This is considered of more importance when making practical recommendations to the various stakeholders based on the findings of this study.

Braun and Clarke (2006) outline six stages of thematic analysis, and these stages were broadly adapted in the thematic analysis of the interview data. First, the researcher familiarized himself with the data. As the researcher was conducting the interviews, he was simultaneously making research memos on the various ideas that were emerging from the interviews and considering any potential patterns that were being observed from each subsequent interview.

As outlined in **Section 4.3.3.4**, the interview data were transcribed, not necessarily adhering to strict notions of verbatim transcribing. After importing the transcripts into the Dedoose CAQDAS application, the researcher went through multiple iterations of

reading the data again, sifting through the transcripts while listening to the recordings of the interviews, making sure the transcription process was accurate, and at the same time trying to identify any patterns that may have been missed in the initial memos that were noted.

After adequately familiarising himself with all the data, and ensuring its accuracy once imported into Dedoose, the researcher began an inductive process of generating an initial set of codes from the data. Many excerpts of the data were marked with multiple codes. In the initial round of coding, a total of 51 codes were identified in the data. However, in a subsequent round of coding, 9 codes were removed, with the excerpts joining codes that already implied a similar concept. This left the researcher with a total of 43 final codes.

In the next stage of the analysis, the 43 codes were grouped into 9 themes. A list of all the 43 codes and the themes in which they were grouped can be found in **Appendix 8**. Themes were broadly generated around the research question elements, and around some of the preliminary findings of the survey. In this way, a hybrid inductive-deductive approach was used at this stage to generate the themes. After the initial themes were identified, each code was reviewed once again, to check if they were appropriately grouped into the right themes.

As an example, one of the themes generated was "Engagement with MOOCs". This theme included the codes BingeLearning, Flexibility, LifeLongLearning, PassiveLearning, SocialLearning, TimeManagement, and TimeSpent. These codes all related to different aspects of learners' engagement with MOOCs, while also being linked to the corresponding survey questions around engagement.

Finally, and most importantly, the themes generated were mapped to the research questions of this study. A detailed description of the qualitative findings, and a figure mapping each qualitative theme and quantitative finding with the corresponding research question can be found in **Section 5.2** and **5.3**. This was considered critical to ensure proper mixing of the data. Through this rigorous hybrid inducto-deductive process of thematic analysis (Swain, 2018), the qualitative data was allowed to bring to life the lived experiences of the interviewed participants , and through mixing these findings with those of the survey

responses, situate their responses within the broader mixed-methods framework of this study in order to best answer the research questions.

4.4 Ethical Considerations

This section details the ethical considerations identified by the researcher at every stage of data collection and analysis of this study, and their management, while outlining some of the broader discussions around ethics in web-based research, and, in particular, research on open education and MOOCs.

Farrow (2016, p. 96) outlines seven common principles provided in guidance given by the three main UK-based professional bodies (UK Economic and Social Research Council [ESRC], the British Educational Research Association [BERA] and the British Psychological Society [BPS]) regarding conducting ethical research on human participants. **Table 3** outlines each of the seven principles and how they were adhered to in this study:

Table 3: Ethical Research Guiding Principles (Farrow 2016, p.96) and their use in this study

Principle	*Usage of Principle in this study*
Respect for participant autonomy	Participants were free to join or leave the study at any point during the interview or survey. Further, participants were given up to fourteen days after their submission of their survey responses or interviews to withdraw from the study voluntarily, should they choose to do so.
Avoiding harm/minimising risk	While the study was judged to be 'low-risk' by the Open University Research Ethics Panel, every precaution was taken to avoid any potential harm to research participants.
Full disclosure	All communication with participants made entirely clear the purpose, methods and the intended use of the study.

Privacy and Data Security	After the completion of Phase Three interviews, all identifying markers from the survey (email addresses) and any in-text identifiers (names, institutions of current study, workplaces) were scrubbed from the transcript, to ensure privacy and anonymity of participants. The survey data was downloaded onto a secure, password-protected hard-drive and deleted off the SurveyMonkey platform, while the interview data remained on the Dedoose CAQDAS platform[20] during the analysis stage. Once complete, the data were removed off the Dedoose platform, while transcripts were retained on the researcher's secure hard-drive.
Integrity	After scrubbing and anonymising the survey and interview data, the raw datasets were made available on request, to review the integrity of the study.
Independence	In every communication with participants, including the invitational email, survey, and interviews, participants were clearly informed that the researcher was from The Open University, UK, and not in any way affiliated with FutureLearn or NPTEL, and that their participation in the survey had

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[20] The Dedoose CAQDAS Platform adheres to a series of international data protection standards, including HIPAA and GDPR, among others. See: https://www.dedoose.com/about/security Retrieved 20 May, 2019.

	no bearing on their performance in their respective MOOCs.
Informed Consent	Participants were provided clear information about the study. In the case of pilot interviews, participants had to sign-off on an informed consent sheet that outlined the goals of the study, while the survey began with an information sheet which the participants had to read and give their informed consent by proceeding to fill in the survey.

While some have made the argument that Internet-based research may not benefit from the same rigorous standards as that of human subject code of ethics (Kozinets, 2010), there has been considerable debate over the nature of what constitutes a 'human subject', particularly in certain online settings (Markham & Buchanan, 2012). Further, within MOOC settings, there is a greater need to be clear about the data that is being collected, and the ways in which this data will be used, particularly as there may be different cultural perceptions of privacy and research across large, diverse learner cohorts (Esposito, 2012). For these reasons, this research adhered to guidelines set out in the Framework for research ethics by the ESRC (2015) as well as the guidelines outlined by the Association of Internet Researchers (AoIR) (Markham & Buchanan, 2012), with the researcher taking a deontological view of ethical research (Kanuka & Anderson, 2017, p. 22), where a prescriptive set of rules on ethical conduct provides direction for any ethically ambiguous situation that might arise through the research process.

First, before any data was collected, the design of the research study had gone through the formal ethical approval procedures set out by The Open University. Minor amendments were suggested by the Research Ethics Committee, specifically involving the usage of data protection laws within the UK **and** India, and with the appropriate amendments made to

the information sheet, the study was approved as a "low risk" study by the Research Ethics Committee at the Open University (HREC/2015/2187).

At every stage of this study, all communication with potential participants, including Information Sheets and Informed Consent forms made clear that this study was being undertaken by an independent researcher from The Open University, UK, and while NPTEL and FutureLearn were both interested in the findings of the study, the researcher was not affiliated with either of the platforms, and that their responses on the survey would have no bearing on their standing on the respective platform.

The first phase of research included recruiting participants through the WhatsApp application. Participant recruitment through public social networks and online forums is a contested issue within the social sciences (Wilson, Gosling, & Graham, 2012), with studies finding success using social networks like Facebook and Twitter to recruit participants (Khatri et al., 2015). However, online discussion forums, that are open to access, such as the ones in MOOCs, are neither totally private nor totally public spaces (Markham & Buchanan, 2012, p. 6), but rather a complex intermingling of the two.

Unlike social media platforms like Facebook or Twitter, WhatsApp requires users to share their phone numbers with each other in order to get connected and start a conversation (chat session). In the case of this study, potential participants had willingly shared their phone numbers on a MOOC forum, with the explicit intent to connect with others on the platform. While the public posting of mobile phone numbers might raise issues related to privacy, with regards to WhatsApp, sharing your number on a public forum could be equivalent to sharing your Twitter handle or Facebook profile page, and while there is a paucity of research on the use of WhatsApp in the recruitment of research participants, this study did not find any ethical concerns with using the application to contact participants., and after the interviews were conducted, any personal information, including their phone numbers, were deleted from the researcher's system.

After potential participants were contacted, and the purpose of the study and their role in guiding it explained, these people were given the option to participate or opt-out of the study. If they wished to continue, an information sheet and informed consent form (**See**

Appendix 9) were sent to the participants for them to read through, digitally sign and return.

In the second phase of this study, the first page of the survey instrument featured an information sheet (**See Appendix 4**), which included an outline of the aims of the research, what sorts of data would be collected, as well as information on how the data collected was going to be stored. Participants were guaranteed confidentiality and anonymity. The information sheet ended with the line in bold

> **Completion of the questions in the survey that follows indicates that you have read and understood the above information and in doing so, consent to be part of this research.**

This allowed participants to give their informed consent prior to participating in the survey (De Vaus & de Vaus, 2013), by accepting the information sheet and moving on to the next page of the web-survey.

As follow-up interviews necessitated a point of contact, an email address was requested from participants who wished to be contacted to be interviewed. This was the only piece of identifying information collected during the survey. Participants were guaranteed that any identifying information would be deleted at the end of the study and were given the option to opt out of the study (ESRC, 2015, p. 39) at any time up to a total of 14 days after their data had been collected. Participants were further informed that the collection of all personally identifiable data complied with the UK Data Protection Act of 1998 and the Indian Information Technology Act of 2000. Lastly, as the data were gathered prior to the GDPR (General Data Protection Regulation) coming into effect, the Survey was delivered using the US-based SurveyMonkey platform, and in accordance with The Open University policy, participants were informed that their data would be stored temporarily in the US.

Once the survey was closed, and all the interviews conducted, the data were saved and backed up on an encrypted and password-protected hard drive, as recommended in the ESRC guidelines (2015, p. 51) which only the researcher had access to. The interview transcripts were analysed using the Dedoose application, which necessitates the uploading of data onto their servers. However, Dedoose complies with all major data protection

standards, including HIPAA and GDPR[21]. Prior to uploading the transcripts for analysis, all identifiable markers of participants were anonymised, and each interview participant was given an anonymous label based on their number in the order of interviews conducted, and the platform from which they were recruited. For example, participant3_FL was a participant recruited from the FutureLearn sample, while participant30_NPTEL was a participant recruited from the NPTEL sample. Further, any identifiable markers in the transcripts, such as their place of employment or place of study were redacted, in line with AoIR standards, as there is considerable evidence that even 'anonymised' datasets could potentially result in individuals being identifiable in web-based research (Markham & Buchanan, 2012, p. 7).

In these ways, the research study followed ethical guidelines outlined by the ESRC (2015) and the AoIR (Markham & Buchanan, 2012), respecting the seven guiding principles of ethical research, as outlined by Farrow (2016) detailed at the beginning of this section.

4.5 Summary of Chapter

This chapter discussed the methodological underpinnings of this study, providing a rationale for why the pragmatic view was used. It went on to discuss the various methods considered to answer the research questions, and why a mixed-methods design was chosen. Next, this chapter provided a detailed look at each of the three phases of this study, namely, the pilot interviews, the survey, and the follow-up interviews. It described the design of each instrument, how participants were recruited, and how the data were analysed in each of the three phases of this study. Lastly, this chapter discussed the various ethical concerns involved with this study and outlined the ways in which each of these concerns were identified and managed.

The following chapter outlines the findings from the Phase 2 Survey and Phase 3 Interviews.

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[21] Source: https://www.dedoose.com/about/security Retrieved 20 May, 2019

Chapter 5: Findings

This chapter will outline the quantitative findings from the survey (Phase 2), along with the qualitative findings from the interviews conducted with Indian MOOC learners on NPTEL and FutureLearn (Phase 3). An interpretation and discussion of these findings, along with answers to the research questions of this study will follow in Chapter 6.

5.1 Survey Findings

Table 4: Survey Respondents by MOOC Platform

Respondents by MOOC Platform

		Frequency	Percent
Valid	NPTEL	2009	84.7
	FutureLearn	364	15.3
	Total	2373	100.0

The survey generated a total of 2373 responses. 84.7% (n=2009) of the responses were from the NPTEL platform, with 15.3% (n=364) of responses being from FutureLearn participants. As is evident (**See Table 4**), there was a disproportionate number of respondents from NPTEL, compared to those from FutureLearn. This disparity is in large part due to the survey being advertised on the homepage of NPTEL for a period of three months, while FutureLearn participants were recruited via an invitation email sent to Indian learners on FutureLearn who had already opted in to be contacted for research purposes. As the demographics of the entire sample would be heavily influenced by the NPTEL respondents, as well as the research focus on a comparison of Indian learners on local (NPTEL) and global (FutureLearn) MOOC platforms, the data from the two samples were analysed separately, and the findings of the survey will be presented separately.

5.1.1 Demographics

This section presents a comparison of findings of the demographics of survey respondents from NPTEL and FutureLearn. An interpretation and discussion of these findings will follow in Chapter 6.

5.1.1.1 Gender

The NPTEL sample showed a sizeable male bias with 82.7% male respondents, compared to 51.6% male respondents on FutureLearn. The FutureLearn sample, on the other hand, had an almost even split across genders, with 46.7% female responses (**See Table 5**).

Table 5: Comparison of Gender of Survey Respondents

		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Male	1662	188	82.7	51.6
	Female	319	170	15.9	46.7
	Transgender	3	1	.1	.3
	Other	12	2	.6	.5
	Total	1996	361	99.4	99.2
Missing	System	13	3	.6	.8
Total		2009	364	100.0	100.0

5.1.1.2 Age

Table 6: Comparison of Average Age of Survey Respondents

		NPTEL	FutureLearn
N	Valid	1987	361
	Missing	22	3
Mean		22.31	35.95
Median		21.00	32.00
Std. Deviation		5.694	15.847

The mean age of NPTEL respondents was 22.31 (SD=5.694), while the mean age of FutureLearn respondents was 35.95 (SD=15.847) (**See Table 6**). NPTEL had a considerably younger demographic, with 81.7% respondents between 18-25, and 11.2% of respondents between 26-35, and with less than 1% of respondents over the age of 45. FutureLearn, on the other hand, showed a more balanced age spread, with 26.9% of respondents being over the age of 45, 4.1% being over 65 (**See Table 7**).

Table 7: Comparison of Age of Survey Respondents

		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Missing	22	3	1.1	.8
	<18	48	21	2.4	5.8
	18-25	1641	103	81.7	28.3
	26-35	225	79	11.2	21.7
	36-45	50	60	2.5	16.5
	46-55	17	46	.8	12.6
	56-65	4	37	.2	10.2
	>65	2	15	.1	4.1
	Total	2009	364	100.0	100.0

5.1.1.3 Student Status

Respondents were asked if they currently were students in some form of formal education: 82.9% of NPTEL respondents identified as currently being students, compared to 38.2% of the FutureLearn sample (**See Table 8**).

Table 8: Comparison of Student Status of Survey Respondents

Are you a student?					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Yes	1666	139	82.9	38.2
	No	318	220	15.8	60.4
	Total	1984	359	98.8	98.6
Missing	System	25	5	1.2	1.4
Total		2009	364	100.0	100.0

Further, the survey asked participants who identified as currently studying to state the format of their studies (see Table 9). For NPTEL 84.8% of students were currently enrolled in on-campus education, and 15.12% in distance learning, compared to the FutureLearn sample, of which 76%

of those in formal education were studying on-campus, and 24% were studying via distance learning.

Table 9: Comparison of Format of Studies of Survey Respondents that identified as Students

If you are a student, please indicate the format of your studies					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Part time face-to-face	120	11	6.0	3.0
	Full time face-to-face	1311	103	65.3	28.3
	Part time distance learning	154	23	7.7	6.3
	Full time distance learning	101	13	5.0	3.6
	Total	1686	150	83.9	41.2
Missing	System	323	214	16.1	58.8
Total		2009	364	100.0	100.0

5.1.1.4 Employment Status

Participants were asked their current employment status (**See Table 10**). 14.2% of respondents in the NPTEL sample identify as full-time employed, compared to 34.3% of the FutureLearn sample. Only 1.5% of NPTEL respondents identified as self-employed, compared to 14.3% of the FutureLearn sample. Unemployed respondents seemed similar for the two platforms, at 10.9% for the NPTEL sample and 10.2% for the FutureLearn sample. 7.7% of FutureLearn respondents identified as being retired, compared to just .2% of NPTEL respondents.

Table 10: Comparison of Employment Status of Survey Respondents

What is your main employment status?					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Unemployed	219	37	10.9	10.2
	Part-Time Employed	30	19	1.5	5.2
	Full-Time Employed	286	125	14.2	34.3
	Self-Employed	30	52	1.5	14.3
	Student	1416	98	70.5	26.9
	Retired	5	28	.2	7.7
	Total	1986	359	98.9	98.6
Missing	System	23	5	1.1	1.4
Total		2009	364	100.0	100.0

5.1.1.5 Education Level

Respondents were asked to report the highest level of educational qualification that they have already attained (**See Table 11**). Overall, the FutureLearn respondents were more highly qualified than the NPTEL respondents. Just over 40% of NPTEL respondents held a High School Certificate or lower, compared to 17.6% on FutureLearn. On NPTEL, 35.2% of respondents had an Undergraduate Degree, and 13.2% had a Post-Graduate Degree, compared to 26.1% and 40.7% on FutureLearn respectively. 1.4% of NPTEL respondents had a PhD, compared to 6.6% of FutureLearn respondents.

Table 11: Comparison of Education Level of Survey Respondents

What is the highest level of educational qualification that you have attained?					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	None	10	3	.5	.8
	Secondary School Certificate (Class X)	28	16	1.4	4.4
	High School Certificate (Class XII)	772	45	38.4	12.4
	College/Vocational Diploma	171	29	8.5	8.0
	Undergraduate Degree	708	95	35.2	26.1
	Post-Graduate Degree	265	148	13.2	40.7
	PhD	29	24	1.4	6.6
	Total	1983	360	98.7	98.9
Missing	System	26	4	1.3	1.1
Total		2009	364	100.0	100.0

5.1.1.6 Language

The survey asked respondents about which language they received their highest level of educational qualification (**See Table 12**). 89.4% of NPTEL and 92.9% of FutureLearn respondents reported that they received their highest educational qualification in English. While having courses in English might limit some Indian learners from adequately engaging with the content, an overwhelming majority of learners have studied in English prior to taking MOOCs.

Table 12: Comparison of Language of Instruction of Survey Respondents

		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	English	1796	338	89.4	92.9
	Hindi	66	7	3.3	1.9
	Assamese	2	1	.1	.3
	Bengali	15	1	.7	.3
	Gujarati	49		2.4	
	Hindi	8	3	.4	.8
	Kannada	3		.1	
	Malayalam	5	1	.2	.3
	Marathi	2	2	.1	.5
	Odia	3		.1	
	Punjabi	1	1	.0	.3
	Sanskrit	4		.2	
	Tamil	22	1	1.1	.3
	Telugu	10	3	.5	.8
	Urdu	1	2	.0	.5
	Total	1987	360	98.9	98.9
Missing	System	22	4	1.1	1.1
Total		2009	364	100.0	100.0

Table header: **In which language did you receive your highest level of educational qualification?**

5.1.1.7 MOOC Behaviour

The survey asked participants to approximate how many MOOCs they had signed up for and how many courses they had finished. Most respondents said they had signed up for 2-

4 MOOCs (34.7% of NPTEL and 39.8% of FutureLearn respondents), 15.7% and 17.3% of NPTEL and FutureLearn respondents respectively had signed up for only one MOOC. Interestingly, 22.5% of FutureLearn respondents claimed they have signed up for 9+ MOOCs, compared to just 8.6% of NPTEL respondents (**See Table 13**). This would suggest that the FutureLearn sample is represented by the more active learners and may not be representative of all Indian MOOC learners.

Table 13: Comparison of MOOC enrolments of survey respondents

In your estimation, how many free online courses have you signed up for?					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	0	410	8	20.4	2.2
	1	315	63	15.7	17.3
	2-4	698	145	34.7	39.8
	5-8	199	57	9.9	15.7
	9+	173	82	8.6	22.5
	Total	1795	355	89.3	97.5
Missing	System	214	9	10.7	2.5
Total		2009	364	100.0	100.0

Survey participants were then asked to approximate how many courses they had completed, with completion being defined as finishing a majority of the course content or earning a certificate on the MOOC. 43.6% of NPTEL respondents and 21.7% of FutureLearn respondents had not completed a single MOOC, 20.5% of NPTEL and 24.7% FutureLearn respondents said they finished one MOOC, 19% of NPTEL and 33% of FutureLearn respondents said they had finished 2-4 MOOCs. Once again, of interest, 10.4% of FutureLearn respondents, compared to just 2.1% of NPTEL respondents, had claimed they had completed 9 or more MOOCs (**See Table 14**). With multiple studies demonstrating low completion rates in MOOCs (Jordan, 2014; Khalil & Ebner, 2014), these findings suggest that the sample of respondents are considerably more active and engaged with MOOCs than the average learner that might sign up for a MOOC.

Table 14: Comparison of MOOCs completion of survey respondents

In your estimation, how many free online courses have you successfully completed? [Completion is defined as finishing a majority of the course content or earning a certificate]		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	0	876	79	43.6	21.7
	1	412	90	20.5	24.7
	2-4	382	120	19.0	33.0
	5-8	71	29	3.5	8.0
	9	42	38	2.1	10.4
	Total	1783	356	88.8	97.8
Missing	System	226	8	11.2	2.2
Total		2009	364	100.0	100.0

Table 15: Comparison of Purchase of Certification of survey respondents

Have you paid for verified certification or any other form of premium service in an online learning resource?		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	Yes	453	53	22.5	14.6
	No	1298	299	64.6	82.1
	Total	1751	352	87.2	96.7
Missing	System	258	12	12.8	3.3
Total		2009	364	100.0	100.0

The survey went on to ask respondents if they had paid for verified certificates or any other form of premium service in a MOOC. 22.5% of NPTEL respondents and 14.6% of FutureLearn respondents said they had paid for a MOOC certificate (**See Table 15**). Of further interest is that of the participants that said they had completed 9+ courses, only 15% of FutureLearn respondents, compared to 45% of NPTEL respondents said they paid for a MOOC (See **Appendix 10** for a detailed breakdown). This finding suggests that even among the most dedicated MOOC learners that complete over nine courses, there is only a 15% conversion rate to a paid service, while dedicated NPTEL learners are more than three times likely to pay for a MOOC compared to FutureLearn.

Lastly, participants were asked to approximate how much time per week they dedicated to MOOCs and MOOC related activity (**See Table 16**). Most respondents said they spent between 1-3 hours a week on MOOCs (27.8% of NPTEL and 35.2% of FutureLearn respectively).

Table 16: Comparison of Hours per Week Spent on MOOCs of survey respondents

Approximately how many hours per week do you spend using free online learning resources?					
		Frequency		Percent	
		NPTEL	FutureLearn	NPTEL	FutureLearn
Valid	0-1	305	48	15.2	13.2
	1-3	558	128	27.8	35.2
	3-5	436	99	21.7	27.2
	5-8	230	47	11.4	12.9
	8+	227	31	11.3	8.5
	Total	1756	353	87.4	97.0
Missing	System	253	11	12.6	3.0
Total		2009	364	100.0	100.0

5.1.1.8 Respondents by Discipline

The survey asked respondents to select all disciplines in which they had enrolled in a MOOC. **Table 17** shows the discipline enrolment by the percentage of respondents in NPTEL and FutureLearn. The disciplines most enrolled on NPTEL were Engineering and Technology (60.5%, n=1216), Computer Science (29.6%, n=595) and Education (15.2%, n=305). The disciplines most enrolled on FutureLearn were Languages (41.2%, n=150), Education (32.7%, n=119) and Humanities (25%, n=91)

Table 17: MOOC Enrolments by Discipline

Discipline		NPTEL	FutureLearn
Medicine	Per cent of sample	2.7%	14.0%
	Count	54	51
Biological Sciences	Percent of sample	4.4%	12.9%
	Count	89	47
Physical Sciences (Physics/Chemistry)	Per cent of sample	10.5%	11.0%
	Count	211	40
Computer Science	Percent of sample	29.6%	22.5%
	Count	595	82
Mathematical Science	Per cent of sample	14.3%	14.3%
	Count	288	52
Engineering and Technology	Per cent of sample	60.5%	21.2%
	Count	1216	77
Architecture	Per cent of sample	2.7%	3.0%
	Count	54	11
Social, Economic and Political Studies	Per cent of sample	5.5%	17.9%
	Count	110	65
Business and Administrative Studies	Per cent of sample	6.4%	17.9%
	Count	128	65
Law	Per cent of sample	1.8%	5.2%
	Count	36	19
Languages	Per cent of sample	10.3%	41.2%
	Count	207	150
Humanities	Percent of sample	8.6%	25.0%
	Count	172	91
Creative Arts and Design	Per cent of sample	5.0%	15.7%
	Count	101	57
Education	Per cent of sample	15.2%	32.7%
	Count	305	119

5.1.1.9 Respondents by State

The survey asked participants, if they resided in India, which state were they currently residing in. **Appendix 11** lists all of the enrolments by state. **Table 18** shows enrolments by per cent in the top 10 States. Interestingly, the states of Tamil Nadu and Maharashtra accounted for the top two states of respondents for both FutureLearn and NPTEL. While the states of Karnataka and West Bengal ranked third and fourth in FutureLearn respondents, the states of Gujarat and Uttar Pradesh ranked third and fourth in NPTEL respondents. When compared with the average Human Development Index (HDI) of each state[22], there was no relation found between enrolments on either platform, and the HDI of the state they were from. This suggests there may not be a difference in the comparative development level of a state, and enrolments on each platform.

However, as the survey did not ask where in each state participants were located, it is unclear how many of these learners are from rural or urban areas of the state, as seven of the ten states listed here happen to be the states with the largest populations in India[23]. This does confirm though that MOOC learners on both platforms are spread well across India, and are not restricted to particular states or regions of the country.

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[22] Source: https://en.wikipedia.org/wiki/List_of_Indian_states_and_territories_by_Human_Development_Index/ Retrieved 20 May, 2019

[23] Source: https://en.wikipedia.org/wiki/List_of_states_and_union_territories_of_India_by_population Retrieved 20 May, 2019

Table 18: Per cent Respondents in the Top 10 States

State	NPTEL %	FutureLearn %	Total%
Tamil Nadu	11.1%	16.9%	12.0%
Maharashtra	11.3%	13.2%	11.6%
Gujarat	11.3%	4.0%	10.2%
Uttar Pradesh	11.0%	5.2%	10.1%
Andhra Pradesh	8.0%	3.7%	7.4%
Karnataka	5.1%	13.8%	6.4%
West Bengal	5.4%	6.3%	5.5%
Telangana	5.4%	2.6%	4.9%

5.1.2 Motivations

The survey included eight Likert-type items on how important various factors were in motivating them to seek, sign up for, and complete MOOCs. **Table 19** shows the means and standard deviations of the responses to the Likert-type items about learners' motivations to take a MOOC. A detailed list of frequency charts for each Likert-type item, and a comparison between the platforms, can be found in **Appendix 12**

Table 19: Descriptive Statistics of Motivation Likert-type Items

Descriptive Statistics of Motivation Likert-type Items						
	N		Mean		Std. Deviation	
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
To gain qualifications/credit for further study	1623	336	4.0203	3.4881	1.16471	1.44754
To improve employment prospects	1616	339	4.0118	3.5900	1.14864	1.43086
For professional development	1630	343	4.2613	4.1545	1.03489	1.28738
For personal development	1638	350	4.3022	4.4971	.97351	.90446
For leisure or enjoyment	1589	333	3.0019	3.5135	1.38973	1.29316
To gain confidence or self-esteem	1635	344	4.1725	4.1308	1.05404	1.08678
As a replacement for college or university education	1612	334	3.2140	2.7186	1.37486	1.40734
To assist my formal studies	1621	336	4.1049	3.6577	1.08928	1.47176
Valid N (listwise)	1520	313				

To compare if any differences exist between the NPTEL and FutureLearn respondents, firstly, the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality were run on all the eight Likert items to check whether the responses followed a normal distribution. All eight

items showed a significance (p<0.001) on both the Kolmogorov-Smirnov and Shapiro-Wilk tests **(See Appendix 13)**, indicating a statistically significant difference in the responses and a normal distribution. For this reason, the non-parametric Mann-Whitney U-Test was considered appropriate to compare the means of the two groups. The rationale for choosing non-parametric tests can be found in **Section 4.3.2.8.**

The Mann-Whitney U-Test showed a statistically significant difference in the responses of NPTEL and FutureLearn participants on six of the eight questions on their motivations to taking a MOOC **(See Table 20)**. A detailed visualisation of the Mann-Whitney U-Test for each Likert Item can be found in **Appendix 14**.

The summary of these tests are as follows: FutureLearn respondents were statistically significantly more likely to be taking MOOCs for leisure (U=321,997.5, z= 6.397, p<.001 two-tailed) and for personal development (U=325,726, z= 4.485, p<.001 two-tailed), while NPTEL respondents were statistically significantly more likely to be taking MOOCs to gain qualifications or credit for further study (U=212905, z= -6.705, p<.001 two-tailed), to improve employment prospects (U=229034, z=-5.032, p<.001 two-tailed), as a replacement for college or university education (U=216925, z=-5.720, p<.001 two-tailed), and to assist in their formal studies (U=229215, z= -4.908, p<.001 two-tailed).

There was no difference in the responses of NPTEL and FutureLearn participants on whether they were motivated to take MOOCs for professional development or to gain confidence or self-esteem.

Table 20: Results of the Mann-Whitney U-Test on Motivation Likert Items

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of To gain qualifications/credit for further study is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
2	The distribution of To improve employment prospects is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
3	The distribution of For professional development is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.907	Retain the null hypothesis.
4	The distribution of For personal development is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
5	The distribution of For leisure or enjoyment is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
6	The distribution of To gain confidence or self-esteem is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.555	Retain the null hypothesis.
7	The distribution of As a replacement for college or university education is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
8	The distribution of To assist my formal studies is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

5.1.3 Learner Experiences

The survey included sixteen Likert-type items asking respondents to rate how important various aspects of the MOOC learning experience was to them. **Table 16** shows the means and standard deviations of their responses on both platforms. A more detailed list of frequency charts for each Likert-type item can be found in **Appendix 15**.

In order to compare if any differences exist between the NPTEL and FutureLearn responses, the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality were run on all sixteen Likert items to check whether the responses followed a normal distribution. As shown in **Appendix 16**, all sixteen Likert items were statistically significant on both tests for normality, which in turn demonstrates that all of these items do not follow a normal distribution. For this reason, the Mann-Whitney U-Test was considered appropriate to compare the responses between the FutureLearn and NPTEL samples.

Interestingly, the Mann-Whitney U-Test showed a statistically significant difference in eight of the Likert-type items, while there was no statistically significant difference in the other eight. **Table 17** shows a summary of the hypothesis testing done in SPSS. A more detailed summary of each Mann-Whitney U-Test can be found in **Appendix 17.**

Descriptive Statistics of Experience related Likert-type items						
	N		Mean		Std. Deviation	
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
Being able to study at no cost	1538	341	4.2640	4.2053	1.07580	1.16016
Being able to improve my study skills	1550	341	4.4613	4.3255	.85832	1.08583
The course being from a prestigious university	1531	337	4.1385	4.0237	1.11339	1.18499
Being able to study the course online	1528	339	4.1976	4.4248	.99122	.81559
The course being of a high quality	1546	338	4.3680	4.5266	.92277	.81576
The course platform being easy to use	1528	340	4.2938	4.4882	.93013	.75444
Opportunities for my work to be assessed	1517	341	3.9796	3.9208	1.17257	1.27517

Being able to try university-level content for free before signing up for a formal course	1526	335	3.9050	3.5194	1.24010	1.53563
Receiving certification for completing the course	1528	336	3.9692	3.6786	1.32171	1.50153
Opportunities for interaction with other learners	1540	338	3.7292	3.8935	1.25503	1.11925
Opportunities for interaction with the instructor	1520	338	4.0191	4.0503	1.11500	.98677
Being able to access the materials at any time	1526	336	4.5406	4.6012	.82143	.80030
Being able to slow and speed up video lectures	1528	337	3.8370	3.6320	1.23643	1.36318
Being able to download course content to my personal device	1544	344	4.3620	4.1802	1.00569	1.07560
Transcripts being provided for videos and slides	1506	334	3.9011	4.0569	1.16604	1.11490
Videos being subtitled	1537	337	3.7385	3.7033	1.28363	1.27280
Valid N (listwise)	1375	308				

Table 22: Mann-Whitney U-Test on Experience Likert-type items

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of Being able to study at no cost is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.513	Retain the null hypothesis.
2	The distribution of Being able to improve my study skills is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.155	Retain the null hypothesis.
3	The distribution of The course being from a prestigious university is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.111	Retain the null hypothesis.
4	The distribution of Being able to study the course online is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
5	The distribution of The course being of a high quality is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.
6	The distribution of The course platform being easy to use is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
7	The distribution of Opportunities for my work to be assessed is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.784	Retain the null hypothesis.
8	The distribution of Being able to try university-level content for free before signing up for a formal course is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.

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9	The distribution of Receiving certification for completing the course is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.003	Reject the null hypothesis.
10	The distribution of Opportunities for interaction with other learners is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.066	Retain the null hypothesis.
11	The distribution of Opportunities for interaction with the instructor is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.742	Retain the null hypothesis.
12	The distribution of Being able to access the materials at any time is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.131	Retain the null hypothesis.
13	The distribution of Being able to slow and speed up video lectures is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.019	Reject the null hypothesis.
14	The distribution of Being able to download course content to my personal device is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
15	The distribution of Transcripts being provided for videos and slides is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.012	Reject the null hypothesis.
16	The distribution of Videos being subtitled is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.566	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The findings of the Mann-Whitney U-Test comparing the two groups are as follows. The analysis found a statistically significant difference that NPTEL respondents found the

following experiential factors of MOOCs to be more important than FutureLearn participants:

- Being able to study the course online (U=290533.5, z=3.834, p < .001 two-tailed)
- Being able to try university-level content for free before signing up for a formal course (U=223288.5, z= -3.811, p < .001 two-tailed)
- Receiving certification for completing the course (U=231766, z= -2.980, p=.003 two-tailed)
- Being able to slow down and speed up videos (U=237390.5, z= -2.347, p= .019 two-tailed)
- Being able to download course content to my personal device (U=236854, z= -3.549, p < .001 two-tailed)

Further, the analysis found a statistically significant difference that FutureLearn respondents found the following experiential factors of MOOCs to be more important than NPTEL participants:

- The course being of a high quality (U=287359.5, z=3.270, p=.001 two-tailed)
- The course platform being easy to use (U=288633.5, z=3.561, p < .001 two-tailed)
- Transcripts being provided for videos and slides (U=272448.5, z=2.516, p=.012 two-tailed)

There was no statistically significant difference between the NPTEL and FutureLearn sample on:

- Being able to study at no cost
- Being able to improve my study skills
- Course being from a prestigious university
- Opportunities for my work to be assessed
- Opportunities for interactions with other learners
- Opportunity to interact with instructor
- Being able to access content at any time
- Videos being subtitled

5.1.4 Learner Challenges

The survey included 9 Likert-type statements about challenges learners might face while taking a MOOC, and respondents were told to rate how strongly they agree or disagree with these statements. As the questions were negative in nature, they were reverse-coded, where 1= Strongly Agree, and 5 = Strongly Disagree with the statements presented. **Table 23** presents the means and standard deviations of these items. A detailed list of frequency charts for each individual Likert-type item can be found in **Appendix 18.**

Table 23: Descriptive Statistics of Challenges Likert-type items

Descriptive Statistics of Challenges Likert-type items						
	N		Mean		Std. Deviation	
	MOOCType		MOOCType		MOOCType	
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
I have experienced video buffering	1392	319	3.2349	3.1379	1.14203	1.12983
I have experienced poor or unreliable internet connectivity	1408	327	3.0866	2.6758	1.20099	1.17180
I have had difficulty understanding the accent of the instructor	1410	325	2.6816	2.2123	1.11000	1.02191
The level of the course has been too advanced	1428	330	2.8508	2.4333	1.06391	1.09854
I have found the assessment insufficient	1332	318	2.7508	2.4591	1.03480	.95145
I have found the assessment too challenging	1356	330	2.9985	2.4667	1.00184	1.01678
I have found peer assessment too time consuming	1309	311	2.9419	2.7621	.98676	1.00063
I have found discussion forums overwhelming	1326	322	3.0777	3.1429	.98326	1.17268
I have had insufficient contact with course instructors/tutors	1369	320	3.1088	2.9219	1.10116	1.07850
Valid N (listwise)	1135	279				

In order to compare the responses of the two groups, the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality were run on the nine Likert items to check whether the responses followed a normal distribution. As shown in **Appendix 19**, all nine Likert items were statistically significant on both tests for normality, which in turn demonstrates that these items do not follow a normal distribution. For this reason, the Mann-Whitney U-Test was chosen to compare the responses between the FutureLearn and NPTEL samples (**See Appendix 20** for each Mann-Whitney U-Test).

Table 24: Mann-Whitney U-Test Comparison of Challenges based Likert-type items

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The distribution of I have experienced video buffering is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.157	Retain the null hypothesis.
2	The distribution of I have experienced poor or unreliable internet connectivity is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
3	The distribution of I have had difficulty understanding the accent of the instructor is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
4	The distribution of The level of the course has been too advanced is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
5	The distribution of I have found the assessment insufficient is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
6	The distribution of I have found the assessment too challenging is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.000	Reject the null hypothesis.
7	The distribution of I have found peer assessment too time consuming is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.001	Reject the null hypothesis.
8	The distribution of I have found discussion forums overwhelming is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.280	Retain the null hypothesis.
9	The distribution of I have had insufficient contact with course instructors/tutors is the same across categories of MOOCType.	Independent-Samples Mann-Whitney U Test	.006	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The Mann-Whitney U-Test found a statistically significant finding in that NPTEL learners were more likely to experience challenges than FutureLearn in seven of the nine Likert-type items. Learners from the NPTEL sample were more likely to experience poor or

unreliable internet connectivity (U=186232, z=-5.539, p < .001 two-tailed), more likely to have difficulties in understanding the accent of the instructor (U=172524, z= -7.205, p < .001 two-tailed), more likely to find the courses too advanced (U=180856, z=-6.837, p < .001), more likely to find the assessment insufficient (U=177197, z=-4.733, p < .001 two-tailed), yet at the same too challenging (U=158819.5, z=-8.534 p < .001 two-tailed). They were also more likely to find the assessment too time consuming (U=181061, z=-3.187, p=.001 two-tailed), and also more likely to have insufficient contact with the instructor or tutors on the MOOC (U=198000.5, Z=-2.773, p=.006 two-tailed).

No significant difference was found between the two groups when it comes to experiencing video buffering or finding discussion forums overwhelming.

5.2 Interview Findings

After an analysis of the survey data, thirty interviews were conducted with participants, to explore in greater detail their intentions, motivations, experiences, and challenges they have faced when participating in a MOOC. The thirty interview transcripts were coded line-by-line, and 42 codes were generated through multiple iterations of open coding. Through further analysis, the 42 codes were assimilated into nine themes. (See **Appendix 8** for List of Codes and Themes). This section outlines each of these nine themes generated, highlighting a few excerpts that were representative of the sorts of comments in each theme, and later mapping each of these themes to the research questions. A discussion of these findings, along with the synthesis of it with the quantitative data, is presented in **Chapter 6**.

5.2.1 Background

This theme included several codes related to background information that learners shared, about their lives, their family circumstances, how they found MOOCs, as well as specifics about their educational and employment background.

For instance, participant8_FL shared her story on how she became a university professor:

> I did my PhD with the [University], and I was in the postgraduate Department for more than 20 years in [University], and I did a lot of research and I also kind of guided you know scholars in their Ph.D., M Phil. and everything. And one more thing that might interest to you in 82, 83 I was in London. ... I did some research at [University], and I also taught a few courses there in that sense I did some things to the honour's people I think, and that was a big experience for me. And then I came back [to India] and continued teaching at the University.

Or, often contained more straightforward statements about their current situation:

> participant9_NPTEL: I am studying in [a] college of engineering and technology at [Location]. I am in 3rd year.

> participant20_FL: [I am a] 63-year-old lady who had graduated earlier and of course I was always a homemaker

And discussion of their families:

> Participant1_FL: I'm married, I have four children, and I live with my spouse in my
> own house.

These sorts of information were collectively grouped into the Background theme. While these statements don't necessarily help in answering the research questions directly, they provide valuable context as to who the interviewed learners are, and how their circumstances might influence some of their experiences with MOOCs. Hence, excerpts from this category of codes were used across the discussion, when appropriate, while specific mentions of universities or places of employment that might potentially identify participants were anonymised.

5.2.2 Comparisons to Formal Educational Experience

As a finding of the pilot study interviews, and with MOOCs being a new form of learning for most persons interviewed, participants were asked to reflect on their own experiences with learning in a classroom (either in high school or university), and to compare the same with the experience of taking a MOOC. Given the demographic profiles of the participants being so diverse, it was anticipated that a number of different viewpoints and reflections would be given. However, responses tended to be overwhelmingly negative towards their own formal institutions of learning, and overwhelmingly positive towards the MOOC form of learning. As mentioned in **Section 2.5.2,** there are considerable challenges facing Indian Higher Education. However, the first-hand accounts of a number of the participants really showcased the poor quality of teaching and learning taking place in various Indian contexts.

participant4_FL: [There is] absolutely no comparison between the way I was educated in college and what is going on today. In fact, that is the reason I am so enthusiastic about it, because this what I wanted but never got, never got an opportunity to learn in this way and quality of the people who are teaching and you know the lectures, the content.

While NPTEL courses may not live up to the same quality standard of Western platforms, learners who took their courses still found them to be significantly better than the courses offered by formal institutions. According to participant25_NPTEL:

> In college, (the) degree is very boring - there is no real-life experience. I mean there is no real-life example…they only enter the equation, that's all. In NPTEL it is not like that – For example, they say the fluid is flowing like that, How come, why, what, when these 5 words very common in NPTEL. Every each and every equation they tell how, when, where, like that. … There is very large difference in my university exam, University teaching and NPTEL teaching there is very large difference. I feel very happy to learn from NPTEL.

These comparisons with their formal educational experience form the backbone of our understanding of the Indian learner experiences in MOOCs, and as such, will be discussed in considerable detail to answer RQ1(c).

5.2.3 Comparisons between Western and Indian MOOCs

This theme related explicitly to participants that had enrolled in MOOCs on both Indian and Western platforms, and the perceived comparison of their experiences on the two. It should be noted that these comparisons were not always between FutureLearn and NPTEL, and were sometimes between NPTEL and Western platforms more generally.

In terms of the design of the course, some participants were able to compare NPTEL with Western platforms they have taken courses on and identify the apparent differences. Referring to the usual hour-long video lectures on NPTEL, participant16_NPTEL, a 24-year-old male postgraduate student from Haryana mentions:

> I think, their (Western platforms') audio-visual quality and the content is very much elite than this NPTEL. NPTEL has been recording through their orthodox professor teaching in their Indian engineering colleges, IIT's. This has been a new thing also for them. I think they have copied the same style that they used to follow in their classroom learning.

Similarly, participant6_FL mentions:

> I find courses in NPTEL not that useful for what I am looking for because they are just recorded lectures or what the teachers do in class. So mostly they teach in a projector or talk in front of a mic, and, you know, just explain. So the things that people do in FutureLearn, they really give an animated view of it.

Despite the number of learners that had taken MOOCs on both platforms being limited, such perceptions of participants that had done both Western and Indian MOOCs are vital to RQ1(c), which relates to the comparisons of learners' experiences between NPTEL and FutureLearn, as well as with other Western platforms.

5.2.4 Impact of MOOCs

These sets of codes related to respondents' perceived impact that MOOCs have had to their lives, and to the potential impact they see MOOCs could have in India.

Participants discussed the benefits they've gained from MOOC assessments:

> participant16_NPTEL: That [Assessment] gives me really a hands-on experience on the things which I have been working upon, that gives me a real-life practical situations, real-life problems, this is the major things. Because I think the best way of learning comes from - you know me just reading out the things, reading out the literature that is really basic first step - but you need really need to deep dive into the water, learn to swim. This is what the assessment gives me.

While other learners were more reflective in the actual impact that MOOCs might directly have on their lives, especially as lifelong learners, but still were able to recognise the broader impact MOOCs could have to certain types of learners:

> participant19_FL: It hasn't impacted me much, frankly! Because the learning is all so superficial … Unless I do a specialisation or something, I don't think I have gotten a chance to use it in an explicit manner, so I can't really comment on it because I learn for knowledge's sake, that's how I am. That's why I am not able to answer that question very well. Whereas if somebody, who has a genuine need for particular course which he has to apply in some context - then yes, there might be some tangible impact. For me, though, there hasn't been much impact, I am just happy learning.

Some of those interviewed were appreciative of the opportunities granted to them to learn through MOOCs

> participant4_FL: I am very enthusiastic about online courses because for a person like me you know mature learner it's not easy for me to go back to college so this is the best option I have.

> participant15_FL: I'm a lifelong learner and just waiting to do a lot many courses from these platforms, and these are good days - you get to learn about so many things and that too for free, that's the best part of it. Really, these people have done a commendable job

In many ways, this theme applies to both the factors that impacted learner motivations (RQ1(b)), as well as factors that were integral to their experience(RQ1(c)) with the MOOC. Hence, excerpts from this theme are represented in various sections of the Discussion.

5.2.5 Patterns of Engagement

The next theme that emerged out of the interviews related to the different ways in which learners engage with MOOCs. Most participants were either working or in some form of full-time higher education. This meant that their MOOC learning would have to work around their schedules.

> participant3_FL: It's largely based on my holidays because I have fixed my schedule accordingly. So on weekdays generally I continue with my college studies and only refer to it (MOOCs) if it is required or something that I know which pertains to this area of my studies. Otherwise, it's mostly just on weekends.

> participant21_NPTEL: I study only on Saturdays and Sundays - first, I watch all the videos released and those keywords that I do not understand I search on Google and assignments are completed on Sundays.

Some participants drew a distinction between courses taken as a hobby and courses for developing skills needed for their careers and distributed their time management accordingly.

> participant15_FL: The courses pertaining to arts, liberal arts or something then I take it as when I get the time but when it is like something to do with big data, something on knowledge management or something related to technology. Then

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I'll follow a particular structure like I would make it a point to go to the website and do my studies & then follow it up over the weekend. So, I'm more religious when it comes to technical courses.

Many more nuanced patterns of engagement were discovered through the interviews, and, as a core component of the experiences of MOOC learners, will be discussed in further detail as part of the answer to RQ1(c).

5.2.6 Motivations and Reasons for Dropping Out

This theme included factors that interview participants mentioned made them sign up to a course, motivated them to finish the course, and in cases where they couldn't, led to them dropping out. Learning a skill specifically related to their careers was one of the primary motivators of most participants interviewed. Curiosity about a topic was also highly cited as a reason to take a course. General interest in a subject area not necessarily related to academic success was also mentioned by some participants as a reason to take a MOOC. When asked why they could not complete the courses they signed on to, a number of reasons were given, primarily related to personal circumstances and a lack of time.

> participant15_FL: Sometimes, I'm not able to complete these days due to work pressure and job commitments.

> participant16_NPTEL: The main reason for my dropping out I would say would be lack of time or rather overlapping of time because certain course had a timeline and that particular timeline I was really busy with professional life so really I could not complete them.

For others, it was realizing that these courses were probably not suited to what they wished to learn, and not relevant to their needs

> participant20_FL: I dropped out of quite a few courses because I didn't find them that interesting recently so I just dropped out because those aren't up to what I thought they would be. They were not that so I said OK I'll be wasting my time and so then I can go to finish the ones that are more relevant to what I'm studying now.

Some participants would not consider themselves as having dropped out, but rather, as always having access to the coursework to go back and refer to it as and when there is a need to:

> participant3_FL: I haven't dropped out on any courses, it's just that whenever I need to find anything useful, I will go and check FutureLearn and I will add the relevant courses to my account. Then I look into that course and see whether it can be of any help to my current needs. So if there's anything I join courses randomly which I think would be helpful. I've completed some courses and then when I look at those courses I'll see, I will refer whether something of the material that is there is any help to my current needs, and accordingly I study them and finish them. So all of my courses are in a running state, most of them are in running state, not dropped out.

There was a considerable nuance in the different factors that motivated learners to stay, complete, or drop-out of a MOOC. The excerpts from this theme form the basis of answering RQ1(b).

5.2.7 Role of the Instructor

These sets of codes related to another factor that emerged from the pilot interviews, that is, how Indian learners value instructors on MOOCs. Overall, participants from both NPTEL and FutureLearn strongly felt that learning from the 'top professors' was a very critical part of their learning experience on a MOOC.

> participant17_FL: Instructors are the main part of it [the MOOC]. Because good instructors will make you understand the course content, what the course can say.

For learners from the NPTEL sample, the ability to study under professors from the prestigious IITs were also of importance

> participant25_NPTEL: I love that in the thermodynamics course, I forgot the faculty name, he is very good … Something Mishra. I forget the professor's name but he's from IIT Kanpur or IIT Kharagpur and is a very good lecturer. Every day he starts with a good thought. Every lecture.

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participant27_NPTEL: The beautiful thing about this NPTEL is because of you know the course is taught by really well-known professors, not some ordinary professors or some who is very new ... So even though they cannot physically teach me, like, they cannot come to NIT and teach a course here, but I still get to learn their experience I still get to learn from them through these videos. So I have both the things: I took a course on my own classroom, and I took a class and course from a world-class professor. So learning that like we always want to learn from big guys. I mean people who have done a big thing on their field and they are teaching the same thing. So that's the thing NPTEL has given me like because personally I have taken a couple of video courses and I personally like say B. Radhakrishna classical quantum mechanics courses are very popular course. I always love that and then recently I downloaded a course of from NPTEL that is atomic physics course but taught by P. C. Deshmukh, so those are the kind of things, I mean I would never learn otherwise I mean I respect I have huge respect for these faculties, and I always find it exciting to learn their own courses.

These sorts of experiences highlight the importance some of the interviewed participants gave to instructors. While some were not happy with the amount of direct contact they could have with the instructor, overall the presence of the instructor remained one of the core components of the learners' experience in MOOCs and is discussed in further detail in the answering of Research Question 1(c).

5.2.8 Challenges Faced

This theme contained all the codes related to challenges that learners felt they faced while learning on a MOOC. The pilot interviews had highlighted some issues that learners from India might face when taking MOOCs, but as the sample size of those interviewed was quite limited (n=4) it was unclear how prevalent some of these challenges might be when extended to a larger sample of learners. The interviews revealed that learners, particularly from NPTEL, faced a number of technical challenges when accessing and using MOOCs, mostly to do with lack of access to a stable, high speed internet connection, which, in at least one instance, lead to a participant not being able to complete a MOOC, despite a desire to do so.

participant27_NPTEL: The problem with me ... what I do personally is because of this lack of Internet connection, I don't get internet connection all the time. So what I do whenever I have an internet connection, I download all the course materials at once and learned it on my own pace. Because to take a course you need to take it regularly. But I don't have this regular Internet connection all the time. So what I do is once all the course materials are available say maybe on YouTube video or some other platform, so I download all the videos, and I go through them at my own pace, so I do not register for the course. Sometimes, like some other point when I have an internet connection that's stable for a couple of days, I do register on edX or Coursera, but eventually, again the same issue arises, of internet connection like so I am unable to complete a single course in edX. So I have never completed a single course like for no certification or something like that.

While participants interviewed from the FutureLearn sample would often have stable enough connections to stream the video content on the MOOC, for many NPTEL learners, the need to download content at a secondary location with stable internet, and to study the material at home, was a recurring theme.

Some learners did mention language-related challenges, with one learner from NPTEL describing it as 'mental lag' when learning in English, but for the most part, learners were okay with the MOOCs being in English, as it is already the language of instruction in the country.

Lastly, the cost of completing a MOOC was a considerable challenge to learners, on both the NPTEL and FutureLearn platform. While the NPTEL courses were priced at a nominal Rs.1000 (approx. £9), most of it going towards the proctored examination, for FutureLearn participants, the ability to afford a certificate, which can cost as high as £69 in some cases, was a significant challenge.

participant2_FL: The price, I feel, was very high for me because I am from an average family: working, learning, and having a wife and children. If you reduce the cost, it will be nice that so many people may complete the course at least to have a certificate, but right now it is impossible.

> participant19_FL: If I do have the money, if it's very critical for my career, and if it's helpful, then I'd pay for it[a MOOC]. For example, I recently explored a very deep sort of set of courses or certifications or even an online degree in design, and I am willing to pay for it. Just that I haven't found any just which is sort of affordable.

These challenges outlined by the learners in the interviews were useful in unpacking some of the deeper issues that learners from India experience in MOOCs, and are explored in greater detail in Chapter 6, in order to answer Research Question 1(c).

5.2.9 Feedback

This theme related to the participants' feedback on the various design elements of the course, as well as feedback on how these MOOC platforms might be better able to reach out to broader Indian populations.

Examples of these codes include feedback on course design:

> participant15_FL: So if somebody wants to do a particular course just for the sake of doing the course, they can do it. Suppose somebody wants to dive deep into the curriculum, then there should be an option there in the form of links and reference material

Or feedback on how a platform like NPTEL can reach a wider audience and gain broader acceptance in India:

> participant29_NPTEL: I feel again that might be a because it's a government-backed project, so I don't know how much funding they have, but yes they need to do a bit more advertising so that both the industry as well as the students accept it more. Because if the industry accepts this for the students will also do. If the students accept this more maybe in 5 years 10 years on the line, they will work in the industry. So they'll also start accepting students who have done this course. So it's a cycle.
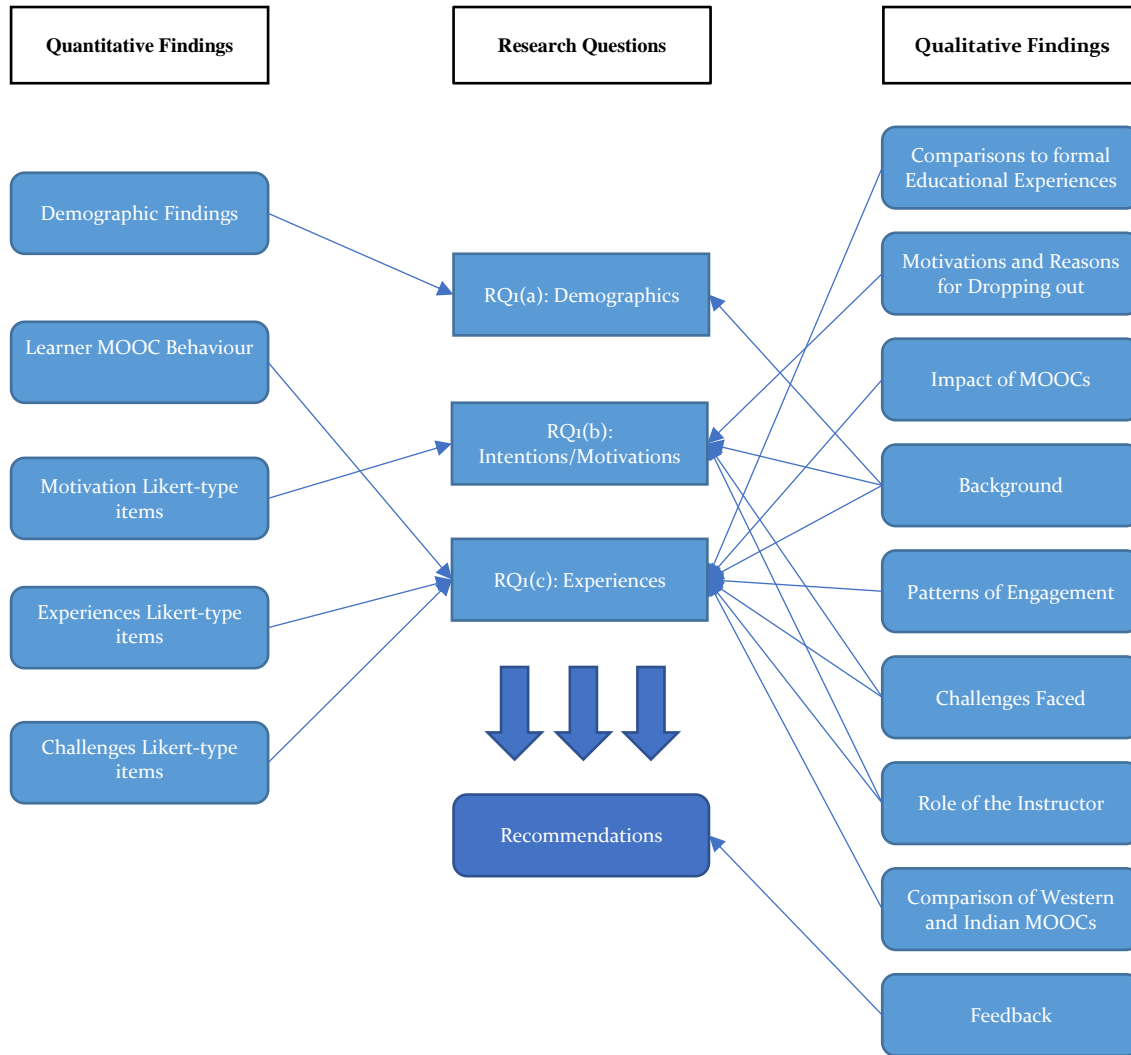
These codes were relevant in the understanding of learner expectations from MOOCs, and, while not directly related to the research questions of this study, were useful in devising a series of recommendations to the various stakeholders of MOOCs in India.

5.3 Summary of Chapter

This chapter outlined the findings from the Phase 2 Survey and the Phase 3 interviews. The Phase 2 survey findings of learner demographics, MOOC learner behaviour, as well as the responses of participants to the Motivation, Experience and Challenges Likert-type items, were compared and presented. Next, the chapter presented the nine themes that were generated through a thematic analysis of the Phase 3 interviews. **Figure 14** maps each of these findings to the three Research Questions of this study.

The following chapter discusses these findings, after mixing and analysing the qualitative and quantitative findings, and provides answers to this study's three Research Questions.

Figure 14: Findings mapped to Research Questions

The diagram contains three columns:

Quantitative Findings
- Demographic Findings
- Learner MOOC Behaviour
- Motivation Likert-type items
- Experiences Likert-type items
- Challenges Likert-type items

Research Questions
- RQ1(a): Demographics
- RQ1(b): Intentions/Motivations
- RQ1(c): Experiences
- Recommendations

Qualitative Findings
- Comparisons to formal Educational Experiences
- Motivations and Reasons for Dropping out
- Impact of MOOCs
- Background
- Patterns of Engagement
- Challenges Faced
- Role of the Instructor
- Comparison of Western and Indian MOOCs
- Feedback

Chapter 6: Analysis

This chapter analyses the relationship between the qualitative and quantitative research findings, and the existing literature on online learning, Indian higher education and MOOCs, in respect of the three themes of this study – demographics, motivations and experiences. As such, the chapter answers each of the three research questions for the study as a summary of each Section.

Section 6.1 analyses the Demographic findings, which identified considerable differences in the demographics between the NPTEL and FutureLearn sample. **Section 6.2** answers Research Question 1(a), highlighting that while there are differences between the two platforms, when compared with existing literature on MOOC demographics, Indian learners on the FutureLearn sample tended to be more educated, more likely to be students, and less likely to be in employment. These demographic findings bring into question the notion of Western MOOCs as being a force for democratising education and development in the Global South.

 Section 6.3 analyses the findings of Learner motivations. The motivations of learners to enrol for MOOCs on NPTEL and FutureLearn were significantly different, with learners from the NPTEL sample more likely to have extrinsic motivations, such as certification, while learners from the FutureLearn sample were more likely to have intrinsic motivations, such as improving personal knowledge, or just for leisure. **Section 6.4** answers Research Question 1(b), with the interviews providing enriching accounts of MOOC learners of different ages using MOOCs for their specific needs, and, of particular note, highlighted how some teachers were making use of FutureLearn MOOCs to improve on their English, and using the MOOCs within their classroom to improve the learning experience for their students.

Section 6.5 analyses the findings on Learner Experiences, highlighting the patterns of engagement of the learners, their perceptions towards interaction with other learners and MOOC instructors, as well as detailed comparisons of their experiences with MOOCs and their formal education. While many of the quantitative findings on learner experiences were inconclusive, the qualitative analysis brought out the rich and varied nature of Indian

learner experiences across NPTEL and FutureLearn. **Section 6.6** answers Research Question 1(c), finding that learners perceived their experience, on both FutureLearn and NPTEL, to be considerably better than their formal studies, with a particular emphasis on how important the presence of the instructor was, compared to interaction with other learners. Participants were apprehensive about the perceived value that MOOC certifications might have in their career or academic progression, and felt the cost of certification, particularly on FutureLearn, was a significant barrier to their persistence with the courses. Lastly, some of the technical challenges, mainly dealing with stable connectivity issues, from the NPTEL sample, once again cast doubt on the ability of MOOCs, which rely, for the most part, on streaming video content, to have an effect with learners in the Global South, who stand to benefit the most from access to educational resources.

6.1 Demographics

This section discusses the demographic findings from the survey, comparing them with the findings from existing studies addressing MOOC demographics. While a single demographic finding may not necessarily reveal much, in their totality these findings give a comprehensive picture of Indian MOOC learners on NPTEL and FutureLearn, and serve as a means of answering Research Question *1a: What, if any, are the differences in demographics of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these demographics differ, if at all, from MOOC learners more generally, as identified in existing studies.* It was found that there were considerable demographic differences between learners from the NPTEL and FutureLearn sample. NPTEL respondents tended more to be male, younger, and currently enrolled in some type of formal education, while FutureLearn respondents, tended to be older, more educated, and in some form of full-time employment.

6.1.1 Gender

Existing studies show that MOOC cohorts, in general, tend to be overrepresented by males (Bayeck, 2016; Ho et al., 2015; Nesterko et al., 2013). A significantly higher disparity is apparent amongst learners from India, with 76% of Indian learners on Coursera being male

(Coursera, 2016b), one of the largest disparities in the world. In contrast, FutureLearn has been shown to have a 62% female population across all its courses (Walton, 2016). The gender balance for survey respondents using the two platforms that are the focus of the current study supported many of the findings from existing literature.

Figure 15: Gender-split in the NPTEL and FutureLearn survey responses
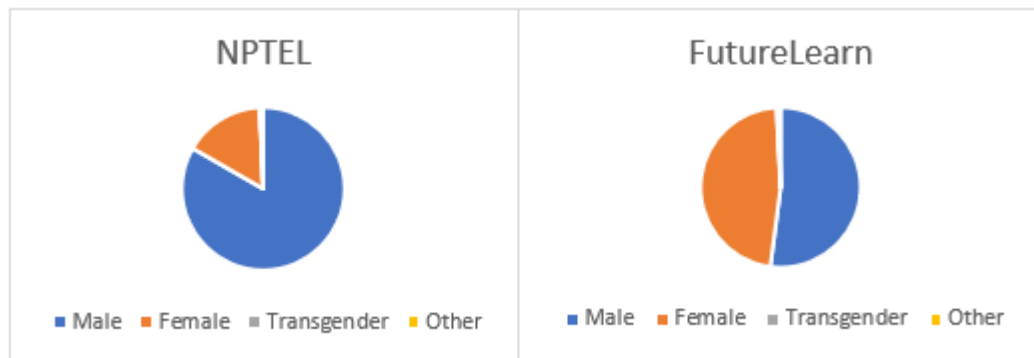
As is clear from **Figure 15,** the NPTEL sample is disproportionally represented by males (82.7%, n=1662), which is comparable to existing findings of Indian cohorts from the data on Coursera (Coursera, 2016b). This is due, in part, by the NPTEL courses comprising almost entirely of Science, Technology, Engineering and Maths (STEM) domains, which are traditionally seen as male-dominated (Smeding, 2012), and are even more so in the Indian context, with only 9% female representation in the IITs (Pandey, 2017), from where the NPTEL courses originate. Therefore, while a 15.9% (n=319) female sample from NPTEL could be seen as a slight improvement in female representation in these courses, there are still significant challenges facing women in STEM in the Indian context, and so far, this data seems to suggest that MOOCs may not be that effective at bridging this divide. Further, while efforts were made to recruit female participants from the NPTEL sample (**See Section 4.3.3.1**), none of the respondents contacted agreed to be interviewed. Hence, a valuable perspective on the experiences of female NPTEL learners is missing from this study. Future research could explore the apparent reasons for female respondents' reluctance to be interviewed.

The FutureLearn sample shows a far more balanced gender-split, with 46.7% (n=170) female respondents. However, a direct comparison with the NPTEL sample would not be

appropriate as FutureLearn has an extensive catalogue of Arts, Humanities and Language courses alongside their STEM offerings, which may attract a higher female population than STEM courses alone. An existing study on FutureLearn MOOCs found that while female learners were slightly underrepresented in a STEM MOOC, a non-STEM MOOC had over double female to male ratio (Shi & Cristea, 2018). While the per cent of female FutureLearn respondents from India is considerably lower than FutureLearn's 62% female user base (Walton, 2016), compared to an equivalent global platform like Coursera, a 46.7% female sample is a significant improvement on Coursera's 24% (Coursera, 2016b).

6.1.2 Age

One of the aims of Research Question 1(a) was to identify the age distribution of MOOC participants from India and to see whether these findings are aligned with existing studies of MOOC cohorts. The comparison of responses from FutureLearn and NPTEL learners also allowed exploration of whether the different platforms appear to attract different age groups. From a study of Coursera participants, Christensen et al. (2013) found that most participants were over the age of 30 (58.9%), while participants from BRICS nations and other developing countries were more likely to be under the age of 30 (63.4% and 58.8% respectively). Similarly, (Liyanagunawardena, Lundqvist, & Williams, 2015) suggest that FutureLearn participant ages tend to be more widely distributed, with less than 17% of participants being under the age of 25, and another study showing that as participants on FutureLearn get older, their activity on the MOOC tends to increase (Shi & Cristea, 2018). In contrast to this literature, the FutureLearn survey respondents from the current study show a significantly higher proportion of younger participants under the age of 25 (34.1%) than identified in the study by Liyanagunawardena et al. (2015) (**See Table 25**). This finding could support the argument that MOOC learners from India on global MOOC platforms, on average, tend to be younger than the overall cohort.

Table 25: Comparison of Age Ranges of FutureLearn survey respondents with FutureLearn platform average from Liyanagunawardena et al. 2015

Age (Range)	FutureLearn platform average (%) from Liyanagunawardena et al. 2015	FutureLearn Indian Learner Survey Respondents (%)
<18	3.9	5.8
18-25	12.5	28.3
26-35	20.1	21.7
36-45	17.4	16.5
56-65	17.2	10.2
>65	9.1	4.1

When the age ranges of FutureLearn respondents are compared with NPTEL respondents, on the other hand, significant differences were observed. Compared to the even distribution of the FutureLearn sample, NPTEL respondents are overwhelmingly younger, with 95.3% of respondents under the age of 36, and 87.5% under the age of 26.

These differences between the two samples suggest that while there might be some overlap in users, NPTEL and FutureLearn are, for the most part, being used by different age groups, and serving different purposes. It also shows that, as a platform, FutureLearn does attract a significant number of middle-aged and retired learners from India, suggesting that global MOOC platforms like FutureLearn could build on to the role MOOCs play in developed countries as tools for career development and lifelong learning. Of particular interest are 14.3% of respondents that are 56 years or older. This suggests that elderly learners, even from India, are making use of MOOCs, and more could be done to encourage these learners from participating in MOOCs by creating courses that are more focused on their needs (Liyanagunawardena & Williams, 2016).

The implications of these findings will be explored in further detail in the following sections that explore the educational profiles and motivations of learners between the platforms.

6.1.3 Formal Studies

A study of Coursera MOOCs showed that 17.4% of overall learners identified themselves as currently being enrolled in formal education, growing to 28.2% of BRICS learners (Christensen et al., 2013), while another study found that 22% of all respondents (n>50,000) were either full or part-time students in some form of formal studies (Zhenghao et al., 2015). In the current study, 38.2% (n=139) of FutureLearn respondents and 82.9% (n=1666) of NPTEL respondents identified as being currently enrolled in formal education. These findings would suggest that on average, MOOC participants from India are more likely to be in some form of formal studies than the broader population of MOOC learners.

After comparing the two platforms in this study, it is clear that the NPTEL sample has a considerably higher number of participants that identify as being currently enrolled in formal education. This is likely to be due to the methods by which NPTEL courses are advertised at college campuses across India through the creation of local NPTEL chapters at various institutions, as well as the promotion of NPTEL and other MOOCs by the Indian government as a means for alternative credentialing towards learners' formal degrees (University Grants Commission, 2016). Furthermore, NPTEL MOOCs closely follows the Indian curriculum and are likely to be used as reference materials for learners around the country, more-so than Western-based resources. This will be discussed in further detail in **Section 6.3.3**.

The findings regarding formal learners' study mode are also of interest. Compared to the national average of 11.14% in India (Department of Higher Education, 2016), 24% of FutureLearn and 15.12% of NPTEL learners participating in the current study are enrolled in distance learning institutions. This could suggest that participating in formal distance education may be correlated with learners' enrolment in MOOCs and, that FutureLearn, despite being a Western platform, attracts a considerably higher percentage of distance learners compared to NPTEL, which is closer to the Indian national average of distance education learners.

6.1.4 Prior Educational Background

Following the analysis of the current educational status of respondents, this study also considered the prior level of educational attainment of learners that enrolled in MOOCs on NPTEL and FutureLearn. One of the key demographics-related observations of MOOC learners throughout the literature is that they are already highly educated and that MOOC learners do not lack 'access' to higher education. In a Coursera study, close to 80% of all learners had at least a Bachelor's degree, and over 40% had a degree beyond a Bachelor's (Christensen et al., 2013), with similar findings from FutureLearn (Liyanagunawardena et al., 2015) and edX (Ho et al., 2015) .

The extent to which these observations apply in the Indian context was a vital consideration of this study, as this would help inform conclusions about the potential impact MOOCs could have within a Global South context.

Table 26: Comparison of Highest Educational Qualification Attained by Percent
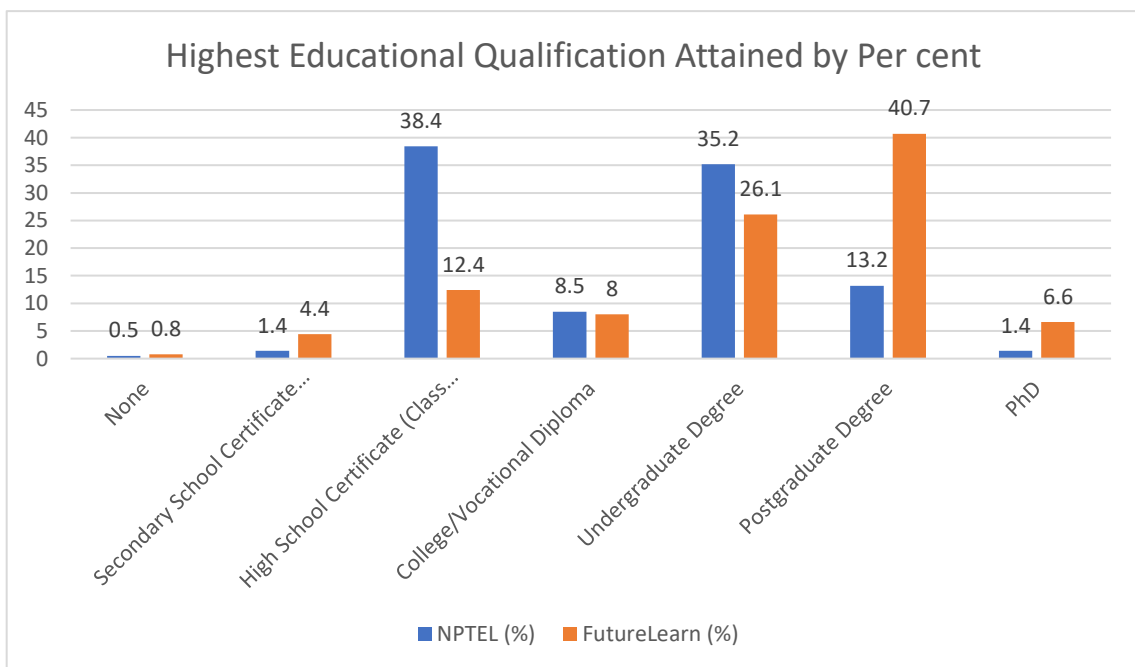
While the findings from **Table 26** above suggest that a considerable number of learners with only High School Certificates are taking NPTEL MOOCs (38.4%; n=772), this is likely to be due to the fact that, as mentioned in Section 6.1.3, most NPTEL learners are in fact students within higher education, and are likely to be undergraduate degree students, as

the majority of courses on NPTEL are undergraduate level courses. Similarly, 35.2% of respondents that have undergraduate degrees are likely to be enrolled in a postgraduate degree. Within the broader context of how NPTEL courses are developed and advertised within the Indian higher education system, these findings are not unexpected.

On the other hand, almost three-quarters of Indian learners on the FutureLearn platform are university educated, with nearly half the learners possessing a Master's or higher qualification. These findings match the current findings from Coursera, edX and FutureLearn, and as such, the Indian MOOC learner population is not significantly different in their levels of education than the global population. This potentially has significant implications for the narrative of MOOCs assisting less-privileged learners from countries like India. These findings show that in some cases, Indian learners on FutureLearn may, in fact, be on average, more educated than the average global MOOC learner, and brings into question many of the claims put forth by MOOC promoters about the benefits of MOOCs to learners in the Global South. While this study looked at the Indian context, further research could explore whether similar patterns of levels of education are maintained in other contexts in the Global South.

6.1.5 Employment Level

As discussed in **Section 6.1.3**, a large percentage of the participants surveyed in the current study, from both the FutureLearn and NPTEL platforms, identified themselves as currently being enrolled in some form of formal education. Of the remainder, the number in some form of employment was of interest, as globally there seems to be a shift in the perceived benefits of MOOCs, from benefitting students or those who lack access to learning, to augmenting workplace learning and skills and professional development (Reich & Ruipérez-Valiente, 2019).

Table 27: Comparison of Current Employment Status of Respondents by Percent
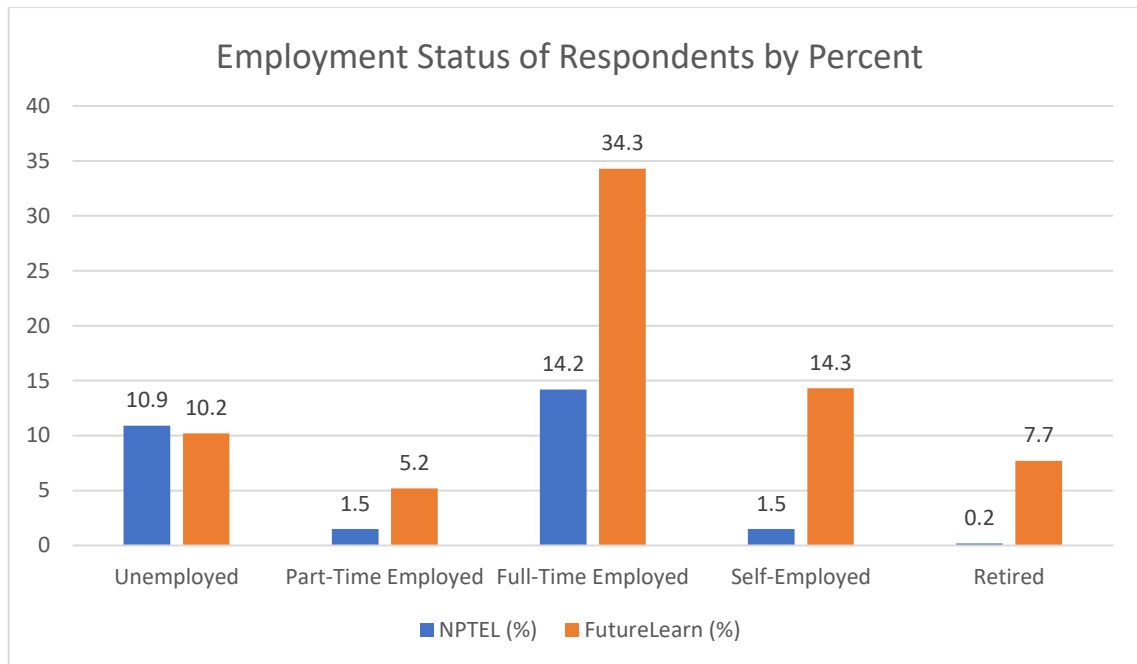
According to **Table 27**, compared to NPTEL, it is clear that FutureLearn has greater participation from Indians who are self-employed (1.5% vs 14.3%) or part-time employed (1.5% vs 5.2%). Similarly, there are a substantial number of learners on FutureLearn who are full time employed (34.3% on FutureLearn vs 14.2% on NPTEL). While the lower numbers for NPTEL can be broadly explained through the aforementioned demographic profile of NPTEL learners being mostly students, these figures are still considerably lower than the approximately 60% of full-time employed learners from multiple studies (Christensen et al., 2013; Zhenghao et al., 2015) of MOOC learners. This suggests that MOOC learners from India are considerably more likely to be students and considerably less likely to be in some form of employment. The effect that these differences might have on the motivations of these learners is explored in **Section 6.3**.

After a discussion of the various demographic findings of this study, the following section will answer Research Question 1(a).

6.2 Answering Research Question 1(a)

This section synthesises the discussion on the Demographic findings of this study and answers Research Question 1(a)

What, if any, are the differences in demographics of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these demographics differ, if at all, from MOOC learners more generally, as identified in existing studies.

As outlined in **Section 6.1**, the demographic characteristics of the NPTEL learner are strongly related to the purpose and audience at which these courses are targeted, namely, students within the formal education system in India. The demographics of FutureLearn users from India, on the other hand, are quite diverse, which suggests that these MOOCs are being utilised by a wide range of learners across the country.

Possibly due to the focus on STEM disciplines on NPTEL, there is a less than 20% female representation in the NPTEL sample. These findings are comparable to the approximate average gender split of Indian learners on Coursera (Coursera, 2016b). This suggests that there is still a considerable gap in the genders in STEM MOOCs, and it would seem NPTEL MOOCs are not necessarily attracting more female learners and bridging the gender-gap that already exists within Indian STEM Higher Education (Pandey, 2017). Comparatively, FutureLearn has an almost 50:50 male:female ratio of learners, possibly due to its courses being offered not just in STEM disciplines, but also in the Languages, Education and Humanities, which were the top three disciplines learners from the FutureLearn sample enrolled in (**See Section 5.1.1.8**). As FutureLearn already boasts one of the more progressive gender ratios amongst MOOC platforms, with over 60% female representation worldwide (Walton, 2016), these findings are promising towards the inclusion of more female learners in MOOC environments, and beyond the disciplinary differences, there could be further lessons that NPTEL could learn from FutureLearn, in bringing more female learners to online learning platforms.

With regards to age, most NPTEL respondents (87.5%, n=1711) were under the age of 26, while on the other hand, the FutureLearn sample had learners evenly divided across all age groups, with over 40% (n=158) respondents being over the age of 35. This suggests that FutureLearn appeals to a wide range of age groups, while NPTEL mostly caters to learners in their early 20s.The lower age profile of the NPTEL learner can arguably be a product of the specific audience these courses are targeted to, namely, college-going students in

Indian universities, whilst the FutureLearn courses appeal to a more general audience. For the FutureLearn sample, compared to an existing study of FutureLearn participants (Liyanagunawardena et al., 2015), the Indian learners were once again much younger than the overall global cohort (28.3% vs 12.5% in the 18-25 bracket), with a relatively even distribution in other age groups.

NPTEL learners overwhelmingly identified as currently being enrolled in formal education (82.9%, n=1666), compared to 38.2% (n=139) of the FutureLearn sample. While the large number of NPTEL students can be explained by the fact that these courses are developed specifically with the Indian curriculum in mind, FutureLearn is still used by a significant number of students in India. Further, the number of respondents that identified as being in formal education in this study are still considerably higher than existing large-scale examinations of MOOC populations, with studies showing 17.4% (Christensen et al., 2013)and 22% (Zhenghao et al., 2015) of learners in some form of formal education. This finding importantly suggests that MOOCs may have a far greater potential to impact younger learners, as well as learners in formal studies in India, compared to the West, while at the same time suggesting that MOOC platforms could be missing out on attracting a more diverse group of lifelong learners from India.

Next, FutureLearn Indian learners were also more likely to be self-employed (14.3%, n=52 compared to 1.5%, n=30), Part-Time employed (5.2%,n=19 compared to 1.5%, n=30) or Full-Time employed (34.3%, n=125 compared to 14.2%, n=286) than the NPTEL learners. While the smaller number of NPTEL respondents in employment could be once again a result of the demographic those MOOCs are specifically targeting, even the FutureLearn sample shows a lower rate of employed learners (53.8%), compared to an average of close to 70% as identified in a synthesis of various MOOC studies (van de Oudeweetering & Agirdag, 2018). Therefore, this could mean that while currently, MOOCs are pivoting towards skills and workplace learning in the West (Egloffstein & Ifenthaler, 2017; Reich & Ruipérez-Valiente, 2019), MOOCs currently are not having the same impact on the working population in India as they are in other contexts, and more research is potentially needed to unpack the usage of MOOCs in workplace contexts within India.

In terms of the highest level of education attained by learners, the NPTEL sample mostly comprises learners with High School Certificates (38.4%, n=772) or Undergraduate (35.2%, n=708) degrees. This is largely due to the proportion of learners who are current undergraduate or postgraduate students, making use of NPTEL MOOCs to supplement their formal studies. In contrast, the FutureLearn sample features more learners with post-graduate degrees than NPTEL (40.7%, n=148 compared to 13.2%, n=265) and PhDs (6.6%, n=24 compared to 1.4%, n=29). This shows that on average, the FutureLearn Indian learner has a higher level of education than the NPTEL learner in this sample. Most importantly, these findings are consistent with a number of MOOC studies (Deboer, Stump, Pritchard, Seaton, & Breslow, 2013; Dillahunt et al., 2014; Ebben & Murphy, 2014; Veletsianos & Shepherdson, 2016; Zhenghao et al., 2015) which have demonstrated that the MOOC learner is typically already highly educated, and not necessarily lacking in access to higher education.

These findings suggest that MOOCs in India, especially Western platforms such as FutureLearn, are likely being used by the privileged few that already have access to learning, and further puts into question the notion of MOOCs as being a democratiser of education and a vehicle for development in the Global South. This isn't to say that MOOCs are not useful in the Indian context, as these learners are still benefiting from these courses, and the following sections explore the rich and varied experiences of these learners. These findings, however, suggest that in the Indian context, MOOCs are reaching a different demographic of learners than what their original intention may have been.

6.3 Motivations

This study explored the motivations of why Indian learners sign on to MOOCs, and whether Indian learners differ from their motivations by platform, or with the global MOOC cohort. This section will discuss the motivations of these learners and conclude with an answer to Research Questions 1(b): *What, if any, are the differences in the motivations of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these motivations differ from MOOC learners more generally, as identified in existing studies.*

The survey found that learners from NPTEL were more likely to enrol in MOOCs for extrinsic goals like career and academic development, while learners from FutureLearn were more likely to enrol for intrinsic goals, such as personal development and leisure. Further, the interviews outlined some of the unique ways in which learners from FutureLearn, young and old, were making use of FutureLearn for personal fulfilment, while learners on NPTEL shared their mostly extrinsic motivations for wanting to enrol in MOOCs, but also how some of these learners were using MOOCs to supplement their perceived poor quality of teaching at their institution. Lastly, this study also found how teachers of English from the FutureLearn sample were using MOOCs in their own professional development, as well as to enhance the teaching experience of their students at their university.

As outlined in **Section 5.1.2**, the non-parametric Mann-Whitney U-Test of comparison of means conducted on the Motivation-based Likert items resulted in the statistically significant finding that the FutureLearn sample of Indian learners were more likely to be taking MOOCs for leisure (U=321,997.5, z= 6.397, p<.001 two-tailed) and personal development (U=325,726, z= 4.485, p<.001 two-tailed) compared to the NPTEL sample. These findings are similar to Christensen et al. (2013)'s findings on Coursera MOOCs where close to half of the participants surveyed said they enrolled in a MOOC just out of curiosity or for fun, rather than for a specific purpose.

Further, the survey also resulted in statistically significant findings that Indian learners from the NPTEL sample were more likely to use these MOOCs for more extrinsic benefits, such as, to gain qualifications for further study (U=212905, z= -6.705, p<.001 two-tailed), to

improve employment prospects (U=229034, z=-5.032, p<.001 two-tailed), to assist their formal studies (U=229215, z= -4.908, p<.001 two-tailed), and as a replacement for college or university education (U=216925, z=-5.720, p<.001 two-tailed), compared to the FutureLearn sample. These results paint a picture of a considerable difference in the motivating factors of learners between the two platforms. While these survey findings illuminate one side of the picture, when select participants were interviewed, the nuances and unique circumstances behind their motivations were uncovered. The rest of this section will discuss some of the key themes emerging from within the learners' motivations and will compare and contrast these findings from those identified through quantitative analysis of the survey responses.

6.3.1 Personal Significance and Lifelong Learning

A number of studies on MOOC learner motivations have revealed that personal interest and curiosity about a subject is one of the main reasons learners enrol in these courses (Breslow et al., 2013; Christensen et al., 2013; Hew & Cheung, 2014; Young, 2013). It was therefore not surprising that several participants interviewed from the FutureLearn sample cited personal interest as being key to their finding and enrolling onto a MOOC, which supports the quantitative findings from the survey. These participants tended to be mature learners and recognized the value of learning from MOOCs beyond the hype around certifications and credentials.

For participant1_FL, an employed man in his early 50's, MOOCs were an opportunity to explore areas of interest he had never considered studying before; *'fiction writing, journalism, well-being'*. For him, these MOOCs were less about certificates and universities, but more about engaging with subject areas that fascinated him as a child, but he had never got the opportunity to pick up.

As most MOOCs are generally free to browse at the very least, such courses could be helping learners such as participant1_FL gain access to learning without having to pay any fees for certification, as certification is not of any particular use to them.

For participant4_FL, a 56-year-old man from the state of Gujarat, taking a FutureLearn MOOC on the British Empire went beyond mere interest for him, it had a deeper personal

connection. His parents had lived through British colonial rule in India and were active members of the independence movement. He felt that taking the FutureLearn course on this subject would allow him to learn about life in India and other colonies from the British perspective, while also finding a connection with the stories he was told as a child by his parents.

He recognizes the merit in understanding the 'other' view on this topic, but as someone with such close personal relations to the subject matter being covered, he still has very strong opinions about the same. Nevertheless, this highlights the unique position FutureLearn, and UK based institutions more broadly have, in providing a different perspective on these often-contested histories and promoting channels of critical thinking and dialogue between British and Indian learners. At the same time, it highlights some of the cultural imperialistic aspects of MOOCs, and while this learner could identify the 'British version' of events being shared on the course due to his closeness to the subject area, it also serves as a reminder that as MOOCs attract learners from across the world, such a distinction may not be as clear to learners who may not have first-hand knowledge of the topic. Hence, MOOC designers must have a sensitivity to such issues, where their content may be interpreted differently by different groups of learners, and, as in this example, may have broader implications in describing one version of historical events, whereas competing ideas from the colonised may be sidelined or ignored in favour of the dominating world-view of the coloniser.

For participant20_FL, a retired 62-year-old woman from Chennai, learning on FutureLearn was less about the certificates or the prestigious universities that offered the MOOCs, but rather, as a lifelong learner, more about the content of the courses, and how the information within them could be of immediate usefulness to her specific circumstances.

> I always enjoyed learning, and since we have settled down in the senior citizens home now, I don't have to cook. So I have all the time in the world, which I utilized in trying to learn all that I wish to learn especially everything regarding health … since I'm a cancer survivor with other complications and my husband is a diabetic, and he has heart problems, so just to learn more about health and since I have that time that is my main motivation to learn.

With no medical background of her own, participant20_FL goes on to proudly list courses on *Nutrition, ECG Assessments, exploring cancer medicine, heart health and genomic medicine*, among others, that she has completed not just on FutureLearn, but also on the Coursera platform. Her *'obsession'*, as she calls it, with health and well-being, is due to her own journey as a cancer survivor, but also as she feels a need to learn more about her husbands' ailments in order to make better-informed decisions going forward. Participant20_FL embodies the ideal lifelong learner, spending the free time in her retirement enriching herself through MOOCs, while also gaining practical knowledge that will be of use as she and her husband grow older.

The stories of these learners highlight the role MOOCs could play with the elderly, who have been observed to be a considerable proportion of learners on FutureLearn (Liyanagunawardena & Williams, 2016), and who are able to recognise courses that have practical benefits to their circumstances. While these learners over the age of 55 are atypical from the findings of the survey responses, (14.3% of FutureLearn responses and just .3% of NPTEL responses) they highlight the demographic of mature lifelong learners, for whom MOOCs could play a vital role in enriching their lives post-retirement. As MOOCs pivot towards becoming commercial providers of skills and workplace training (Reich & Ruipérez-Valiente, 2019), it is hoped that participants at the fringes of the MOOC cohort are not side-lined for more commercially viable segments, and while the Indian platform of IITBombayX has developed special *LifeMOOCs*, courses intentionally focused on lifelong learners that are not as rigorous as their main MOOCs (**See Section 2.6.4**), NPTEL could also consider offering courses on more general topics, at a slightly easier level of difficulty, that could be accessible to the curious, mature learner, who may not wish to take a dedicated college-level course in STEM disciplines.

That being said, not all the respondents taking MOOCs for personal reasons were older and retirees. There are learners who have to resort to taking MOOCs to satiate their desire to study a particular subject they may not be able to pursue due to cultural reasons, or due to institutional limitations. participant3_FL, a 20-year-old university student from Delhi candidly shares the reason he was motivated to enrol for courses on FutureLearn:

Because of being a law student I am forced to study law only, and this[FutureLearn] gives me a greater freedom to catch up on all those subjects which I do want to study, but I am unable to, such as history, geography or geology, which do interest me. Being in Law university I am bound to study law, but I did not choose law as my first option. It was not ever my first option; It was because of my family that I choose law. So having an interest towards history and geology was my first idea and using online courses I'm trying to build up on those interests, and that is one of the most crucial part that online courses serve to me, and in a way, they helped me with my law career also.

Similarly, for participant6_FL, a 20-year-old female undergraduate engineering student, MOOCs provide her with the opportunity to explore other domains of study that are not available to her in the rigid engineering syllabus of her college:

I want a broader perspective on other courses that are actually there. India is not that developed on other extra courses that are not related to engineering. So we kind of has a lot of courses in college on engineering. But we don't have stuff like cryptology, criminology. So, we focus mainly on mechanical, electronics and computer science. So apart from that, I want more a broader perspective on what the world is studying. So that's why I take courses on FutureLearn.

In India, there is incredible pressure to follow specific careers that might seem lucrative or might have greater long-term potential. This pressure is woven into the social fabric of Indian society and is often enforced by the parents of the child (Arulmani & Nag-Arulmani, 2006). For this young man from an upper-middle-class family in Delhi, MOOCs provide something he cannot receive through his formal education. Due to pressure from the family to pursue Law, he has had to give up on subjects that genuinely interest him, such as history, geography or geology. Having no choice in the matter, he followed his parents' wishes and studies at a Law University. For him, MOOCs are an escape into fields he is passionate about and really excite him, and FutureLearn provides him with the platform to learn about and engage with content that he otherwise would not be able to study.

It is unclear how common stories like participant3_FL's are, but it suggests that in this hyper-competitive career-driven environment where people are forced to choose a

lucrative career over their personal interests, MOOCs could have a role to play in India in allowing learners to study their passions and engage with the content in a meaningful way for themselves. Similarly, as participant6_FL suggests, there could be a case made for integrating off-subject MOOCs in specialist-degrees such as Law and Engineering, to allow learners to engage with disciplines that may not be directly related to their formal degree, but nonetheless fuels the imagination of learners and broadens their perspectives. Hence, lifelong learners need not necessarily be represented just by traditional notions of the mature learner (Gorard & Selwyn, 2005), as highlighted by earlier examples in this section, but in the Indian context, some younger learners too are using MOOCs to bypass social norms and expectations, as well as institutional limitations, and get to learning resources that have a personal significance to themselves, rather than some extrinsic motivating factor.

6.3.2 Academic and Career Development

Many participants that were interviewed noted extrinsic motivators for enrolling in a MOOC. The most important extrinsic motivators were perceived benefits to learners' careers, in helping them find jobs after graduating, or a benefit to their academic development, through assisting them in their future university applications. These participants were mostly from the NPTEL sample, confirming the findings from the quantitative survey analysis which highlighted that NPTEL respondents were significantly more likely than the FutureLearn respondents to be taking MOOCs to gain qualifications or credit for further study (U=212905, z= -6.705, p<.001 two-tailed), and to improve employment prospects(U=229034, z=-5.032, p<.001 two-tailed).

These learners often were quick to identify a tangible benefit that can be brought to them through participating in MOOCs.

> Participant25_NPTEL: MATLAB is very essential for mechanical engineering, which is why I am learning [on this course]. I need to improve myself for my future.

Here, the participant was recognizing a skill that was needed for his own career development, which was not being adequately covered or taught at his college, which is why he resorted to taking a MOOC on NPTEL. Similarly,

Participant21_NPTEL: These courses [on NPTEL] are not being taught in college right now, so I want to do it right now, because I only have two years left to join the industry, so I want to get prepared before others.

This participant is recognizing the competitive advantage he might have over his peers by taking NPTEL courses and adding them to his resume. While there have been some studies into employer perspectives on MOOC certificates that have been promising (Egloffstein & Ifenthaler, 2017; Radford et al., 2014), these are mainly from Western contexts and limited to specific domains of information technology. It is unclear how much value a MOOC certificate might have in the eyes of Indian employers. However, in an ultra-competitive recruitment environment such as in India, possessing additional skills or knowledge over your peers could be considered at least somewhat advantageous.

Participant7_NPTEL, an 18-year-old undergraduate student from the state of Uttar Pradesh, wishes to change his career and in turn, his degree at his university. He believes that the certification he can receive from the NPTEL MOOCs can be advantageous to his needs:

I want to transfer [my degree] to mathematical physics, so I need some certificates in physics courses. The certification from NPTEL is one of the factors they look at.

As discussed in **Section 2.2**, one of the main challenges facing the major MOOC platforms around the world is having their courses formally recognised by universities, and in turn, by employers. The Indian government has introduced a framework to formalize certification from NPTEL to provide credits towards ones' formal degree (University Grants Commission, 2016), and as is clear from participant7_NPTEL's motivations, universities are starting to take notice, and are considering NPTEL certifications in their applications. As the government's MOOCs for credit framework is an opt-in system, it is uncertain to what extent universities are adopting these measures at their institutions. There could certainly be tensions arising from allowing learners at your institution to take 20% of all their courses entirely online, as it could downplay the role of professors and faculty at your own institution, and there has already been such a case, where such tensions came to a boil in a US context, where philosophy MOOCs were to be broadcasted to learners through edX at other institutions, downplaying the role of the professor at these local universities (K.

Hartnett, 2013; Lewin, 2013). That said, the Indian context suffers a considerable shortage of faculty (See **Section 2.5.2**), and professors there may be more receptive to MOOCs as an additional form of instruction to their learners who would demand a greater quality learning experience. The adoption of MOOCs into formal Indian higher education, and the potential tensions arising from such a move, is a promising area for potential future research.

While only a small minority of the NPTEL sample did not identify as currently being students, there were some who saw the benefit of NPTEL as a tool to improve skills within the workplace. Participant16_NPTEL, a 24-year-old who recently graduated with a postgraduate degree, found that there could potentially be value in showing a certificate from '*elite universities'*:

> This is my hobby to learn new things via these E-courses. The very basic thing is you can get quality education right from Harvard, Oxford and IITs, all those kinds of elite universities, elite curriculum, and elite technologies that are currently prevalent in the market. Secondly, of course, for my professional development, this can help add a few dollars to my salary, that could be really helpful!

This participant goes on to share that his employer has encouraged him to continue taking MOOCs for his professional development, and he feels that having these courses from top universities on his resume has had a positive impact on any potential promotions he might be seeking.

What is of interest is his association not of the course content or any learning he might have received, but rather the value of the 'elite' university certificates, as being a key motivator. While there was no statistically significant difference between the NPTEL and FutureLearn sample, both FutureLearn (M = 4.0237 SD= 1.18499, n= 337) and NPTEL (M= 4.1385; SD= 1.11339, n = 1531) survey respondents had very favorable views towards MOOCs being from prestigious universities (**See Appendix 15** for comparative histograms). These findings perpetuate the existing notion that for many Indians, as well as Indian employers, the brand value of the university you attended still is a key determinant in your hiring or promotion, and that some learners may be taking MOOCs from these universities, not necessarily to learn a new skill or brush up on existing knowledge, but rather to pad out

their resume with high profile universities they have completed MOOCs from in order to once again gain a competitive edge in the marketplace.

This sort of brand association is also one of the key selling points that MOOC providers, especially in the West, make use of in marketing their courses to learners around the world. As long as such perceptions of the value of a university brand persist in Indian society, MOOCs will continue to attract hopeful learners that are slowly rising up the hierarchy of Indian society, who wish to have the elite-university tag on their resumes, but may lack the resources to fund their study abroad.

Not only NPTEL respondents reported using MOOCs for career and academic advancement. The same applied for some FutureLearn participants. For example, participant17_FL, a 21-year-old male from the state of Tamil Nadu, was preparing to apply to universities overseas for his postgraduate studies. For him, studying on FutureLearn served two primary purposes. First, it helped him in his immediate future, by preparing him for the IELTS examination through the popular British Council MOOC on FutureLearn. Secondly, he had taken several courses related to his area of study (Physics), not just from FutureLearn but from a number of Western MOOC platforms. He believes that taking these courses will add value to his resume as he applies to universities overseas as well.

While there are anecdotal accounts of learners and platform promoters attributing MOOC certificates with getting into their 'dream university' or 'dream job' [24] there has yet to be definitive studies on how much additional value a MOOC certificate offers learners making academic applications, or in job interviews, especially in the Indian context. Nevertheless, examples like these show that some learners from India see some potential value in mentioning MOOC certifications in their resumes (**Section 6.5.6** discusses learner

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[24] edX Learner Stories: https://blog.edx.org/learner-stories/ Retrieved 20 May, 2019
FutureLearn 'Meet Our Learners': https://learner-stories.futurelearn.com/ Retrieved 20 May, 2019
Coursera Learner Story Archives: https://blog.coursera.org/tag/learner/ Retrieved 20 May, 2019

perceptions of the value of MOOC certification in more detail), and have these clear extrinsic motivators that influence them to enrol in a MOOC.

6.3.3 Supplementing Formal Education

A recurring theme by participants interviewed from the NPTEL sample was the use of NPTEL learning resources as a supplement to, or in some cases a substitute for, what many considered to be low levels of teaching at their formal institutions.

For participant23_NPTEL, a 21-year-old engineering student at a regional college in the state of Maharashtra, the motivation to take an NPTEL MOOC was not to get a certificate or even to complete a course. For him, it was about retrieving the content that suited his needs, and ignoring the rest:

> I use it [NPTEL] to build my fundamental concepts only. So like if there are 40 videos, I just watch 10 to 15 videos so that I get the grasp of the basics, and then I study the rest from the books.

There have been numerous studies that question the completion metric of MOOCs and mention learners that enrol in courses just for the piece of content that meets their needs and ignores every other element of the course. Downes (2013) makes the analogy of MOOCs with that of newspapers, arguing that nobody ever complains about the low completion rates of newspapers. "People don't read a newspaper to complete it, they read a newspaper to find out what's important" (Downes, 2013). Similarly, as in this case, participant23_NPTEL is using the ease of the video format to brush up on the fundamental concepts of his engineering courses, after which he feels confident enough to return back to his books for the more complex workload, and doesn't need to *complete* the course, as arbitrarily defined by the MOOC designer. In fact, these learning strategies align with the Self-Directed-Learning (SDL) motivational framework, as outlined in **Section 3.2.2**. As identified by de Waard, Kukulska-Hulme & Sharples (2015, p. 236), the ability for learners to identify, adapt, and direct their learning in order to achieve personal learning success demonstrates successful use of Self-Directed-Learning strategies to motivate themselves through the MOOC.

Similarly, participant22_NPTEL says that he takes NPTEL courses not just to improve knowledge, but to 'clarify concepts' that he has difficulty understanding. And for participant9_NPTEL, MOOCs are a way to refresh concepts that they may have missed or not comprehended adequately during their formal classes.

Lastly, participant5_NPTEL, a 21-year-old engineering student from the state of Andhra Pradesh, says that NPTEL has significant value for him and his classmates, being motivated out of frustration with the resources and academic schedule that has been provided at his college. He describes one Chemistry professor who was particularly weak in his teaching, and how the class as a whole, upon finding the corresponding NPTEL course and noticing that the curriculum of the MOOC aligns perfectly with their own class, decided to bypass the professor altogether and exclusively used the NPTEL MOOC to study for their examination.

These cases are a good illustration of how NPTEL is meeting a much-needed requirement within smaller higher education institutions in India, while at the same time highlighting the poor state of learning at these institutions. These findings are also supported by the survey findings, which found NPTEL respondents to be significantly motivated to take MOOCs to assist in their formal studies (U=229215, z= -4.908, p<.001 two-tailed), or as a replacement for their college or university education (U=216925, z=-5.720, p<.001 two-tailed).

One of the most recurring themes throughout the interviews with participants, both from NPTEL and FutureLearn, was that of the poor state of education they receive or have received in the past, and what an immense 'step-up' the MOOC experience was. The problems participants had with their experiences with higher education in India, and how MOOCs could be helping solve some of these challenges are covered in greater detail in **Section 6.5.4**.

6.3.4 Resources for Teachers

The potential of MOOCs to be used to deliver teacher professional development at scale has already been discussed in the literature (Laurillard, 2016; Vivian, Falkner, & Falkner, 2014), especially in the Global South (Laurillard & Kennedy, 2017; Mtebe & Kissaka, 2016)

which has a desperate need to train a considerable number of teachers. Furthermore, there is evidence of teachers using MOOCs as a resource for their classroom through flipped-models of teaching (Bruff et al., 2013; Delgado Kloos et al., 2015; Y. Li, Zhang, Bonk, & Guo, 2015; Pérez-Sanagustín et al., 2017; Soffer & Cohen, 2015), or to brush up on the current state-of-the-art, as one study found 4.5% of around 250,000 enrolments on MITx courses were teachers (Seaton, Coleman, Daries, & Chuang, 2014)

While the survey did not explicitly ask respondents to state if they were educators, amongst the interviewed FutureLearn participants, two were, in fact, teachers of English themselves. With FutureLearn being a clearly British MOOC platform, some respondents identified the high-quality Language courses, mainly English, as being a motivating factor for them enrolling, especially so for participant14_FL, an English teacher at a public school from the state of Bihar:

> My motivation was just my eagerness! I actually want to learn English for my betterment and also to improve my teaching skills because I can't afford to go learn from big universities. This is the biggest platform for me to learn there without any cost, and it suits according to my profession also. I don't have to go to attend the classes because I have to take my own classes at school. So according to my timing, it suits me.

There are a number of key issues here that he outlines as motivations. Firstly, as mentioned above, there is an association of FutureLearn with high-quality resources for English Language learning. The state of Bihar consistently ranks as one of the Indian states with the poorest teaching and learning standards. This motivated English teacher wants to improve his English, and in turn, the teaching he offers to the students at his school. He highlights two key features of the MOOC, the free-to-access nature, and the flexibility, as being key reasons, he uses these courses. Interestingly, both FutureLearn (M = 4.2053, SD=1.1606, n=341) and NPTEL (M= 4.2640, SD=1.07580, n=1538) survey respondents very strongly felt that being able to study at no cost was an important factor in their MOOC learning experience (See **Appendix 15** for Histogram Comparisons). While FutureLearn course certificates are not free, for him, the free version of the course, with its content and additional resources, serves his specific purpose, and he finds it much better than the

resources he has at his disposal at his rural location. Similarly, with the flexibility MOOCs offer, he can learn at his own pace, and work around his already busy schedule to make time to improve his English. In these ways, teachers could be making use of MOOCs for professional development, without any extrinsic motivation in the form of certificates or recognition, but for the fundamental purpose of self-improvement.

Participant13_FL, another English teacher at a reputable university, also mentions the ability to use the resources, specifically the courses on Shakespeare, to enhance her own teaching in her classroom:

> I have a PhD in English literature, and I was teaching an undergraduate course on Shakespeare, and I just registered for the course on Shakespeare recently. You know, it gave me access to a lot of visuals, and it was being conducted by Johnathan Bates, a very well-known Shakespeare scholar, and it had a lot of downloadable material and things which helps a lot in teaching the students so you can go beyond the text.

She goes on to discuss some of the limitations of teaching Shakespeare to Indian learners and how this particular MOOC made the learning seem more relatable to them:

> I liked the video components [of the MOOC] because you got to hear from a very famous Shakespeare scholar and he presented all these objects that were associated with Shakespeare's life, which you would not get to see. You might normally see a picture, but here was a very respected scholar who is actually handling these objects from the Shakespeare Trust and he was giving you a great detail about these objects that Shakespeare actually might have used in his life ... So that was very nice, and I enjoyed it and the students whom I shared this also greatly enjoyed this, as this is something they would otherwise never have the opportunity to experience.

She discusses using the additional materials provided on the course to engage the learners in her classroom, while also encouraging them to take the MOOC for themselves and participate in the discussions with other learners from around the world.

While these may just be two isolated examples, it shows how particularly motivated and resourceful teachers in India, despite limited resources at their disposal, and little to no

scope for professional development, could still make use of MOOCs to enhance their teaching and their professional development. It also suggests that FutureLearn has the unique advantage of being recognised as a leading platform for resources on English and could be used more widely by English teachers in India, that are using British literature such as Shakespeare in the curriculum.

6.4 Answering Research Question 1(b)

This section synthesises the discussion in **Section 6.3**, to answer Research Question 1(b):

What, if any, are the differences in the motivations of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these motivations differ from MOOC learners more generally, as identified in existing studies.

Using the non-parametric Mann-Whitney U-Test, the study identified statistically significant differences in the survey responses of the intentions and motivations of Indian learners from the FutureLearn and the NPTEL sample.

The survey found that learners on FutureLearn were statistically significantly more likely to enrol on a MOOC for leisure (U=321,997.5, z= 6.397, p < .001 two-tailed) and personal development reasons (U=325,726, z= 4.485, p < .001 two-tailed) compared to the learners on NPTEL. The findings from the interviews conducted on these learners confirmed these findings, with FutureLearn participants sharing in detail the multitude of personal and societal significance behind their intentions to enrol in MOOCs, as well as the reasons they stay motivated to achieve a personal goal in their own journey through the MOOC.

Mature lifelong learners looked beyond the possible benefits of credentials and certification and described how FutureLearn provided them with the opportunity to study areas of deep personal interest that they could not study elsewhere. For one such participant, studying a course on the British Empire provided him with the ability to critically engage with content from the *other* perspective, on an issue that is deeply personal to himself and his family due to their involvement with the independence movement in India. For another retired female participant living in an elderly care facility with her husband, MOOCs provided her with the ability to learn more about the illnesses

of herself and her husband and gave her the ability to make well-informed decisions on her own health and wellness. In these ways, participants shared how MOOCs were an incredibly useful resource and of immense value to their personal growth.

Younger participants from the FutureLearn sample described how MOOCs gave them the opportunity to study subject areas they were passionate about, but could not formally study, either due to pressure from their family or due to the limited offerings at their university. These participants were not expecting any tangible benefit to their immediate career or academic standing but instead saw these MOOCs as an opportunity for self-development, to explore areas of interest without the usual stresses that accompany formal learning, such as timed assessment and gradings. It was more about the love of learning and the ability to learn from the best universities in the world. These vignettes of the various FutureLearn interview participants demonstrate these learners using Self-Directed-Learning (SDL) strategies (Garrison, 2003) to make their own goals, that may or may not align with the completion metric of the particular MOOC, and these findings support existing studies (de Waard, 2016; Loizzo et al., 2017) that show learners making their own goals and finding satisfaction with their self-determined objectives from the MOOC.

In comparison, the survey found that learners on NPTEL were statistically significantly more likely to enrol on a MOOC for extrinsic reasons such as to further employment prospects (U=229034, z=-5.032, p < .001 two-tailed), to gain qualifications or credit for further study (U=212905, z= -6.705, p < .001 two-tailed), or to supplement their current formal learning experience, either as a replacement for their college or university education (U=216925, z=-5.720, p < .001 two-tailed), or to assist them more directly in their formal studies (U=229215, z= -4.908, p < .001 two-tailed). Once again, an analysis of the interviews of participants supported some of the survey findings. Learners on NPTEL identified specific skills and concepts that are not part of the syllabus at their higher educational institutions but are more generally considered to be in demand in the marketplace and used NPTEL MOOCs to acquire those skills and knowledge. Some of the participants interviewed perceived NPTEL certifications as giving them the competitive edge that they need to get recruited after graduating successfully. Similarly, a participant already in the

workforce mentions how taking MOOCs has greatly benefited his professional development, but more importantly, with certifications from some of the elite universities, how having his resume filled with these MOOCs will help him move forward in his career. Despite the apparent desire on the part of learners to have MOOC certificates hold value in the eyes of employers and university admissions committees, there is still a considerable lack of research into whether there is any tangible benefit from possessing MOOC certifications, outside of anecdotal accounts.

Another key motivator for participants from the NPTEL sample, who tended to be younger and current students at higher educational institutions, was the ability to use MOOCs to supplement their formal studies. Participants described how they used NPTEL MOOCs as reference materials for concepts they could not understand in class, or to brush up on their fundamentals. Further, some participants had to resort to MOOCs because of considerably poor standards of teaching at their local institutions. These participants felt that NPTEL, with its stellar group of IIT professors, provided a much higher quality experience than what their local institutions could provide. While there was no significant difference between NPTEL (M=4.1385, SD=1.11339, n=1531) and FutureLearn (M=4.0237, SD=1.18499, n=337) participants, both groups rated the notion of MOOCs being from 'prestigious universities' as being very important to their motivations for taking and persisting with MOOCs, and the findings from the interviews support this claim (See **Appendix 12** for Histogram Comparisons).

In contrast, a couple of the participants from FutureLearn were English teachers, one in a school in rural Bihar, and another at a reputable university in Chennai. For the schoolteacher in Bihar, FutureLearn gave him the opportunity to improve on his English skills, while the flexible schedule of a MOOC as well as the lack of a cost inhibitor, gave him the opportunity to learn at his own pace, without the pressures of fees or at the cost of his busy schedule. For the university professor, it was the FutureLearn MOOC on Shakespeare in particular that gave her access to interactive materials that she could use as a resource in her classroom, and provide a broader contextual awareness of the background to Shakespeare, rather than relying solely on the text, or shallow reference materials, as she had previously had to resort to. In these ways, we see teachers using

MOOCs, for flexible, free, professional development, as well as to use resources available on the MOOC to provide a more engaging learning experience for her students, using MOOCs more as OERs for their classrooms rather than for their intended purpose.

Therefore, while learners on NPTEL are using MOOCs to supplement and in some cases circumvent a poor learning experience, few resourceful educators are using MOOCs on FutureLearn to make up for the limited resources at their disposal and to improve the teaching they provide. Both these cases highlight the potential that MOOCs have within the formal education sector in India, and demonstrate the varied motivations of learners from India, that would otherwise not be revealed through purely survey metrics.

6.5 Experiences

Experiences, for the most part, tend to be subjective in nature. This study defined the learner experience as the subjective perceptions of learners about their attitudes, behaviours, concerns and evaluation of their own process of learning. With a sample size of thirty interviewed participants (15 on FutureLearn and 15 on NPTEL), this study explored in depth the individual experiences of the participants, while recognising the inherent limitation of such an exploration in its ability to be extrapolated to the general population. Hence, this study used a pragmatic approach, making use of mixed-methods to go beyond the individual experience, in an attempt to make sense of some broader experiences of Indian learners on MOOCs through triangulation of the interview data with the findings of the survey, and to identify differences in these experiences between learners from the NPTEL and FutureLearn samples.

The purpose of this section is to answer RQ1(c): *What, if any, are the differences in the experiences of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these experiences different from MOOC learners more generally, as identified in existing studies.*

This section is broken up into the key themes that were generated out of the thematic analysis of the thirty interviews (**See Section 5.3**). **Section 6.5.1** discusses the Engagement of learners, **Section 6.5.2** discusses Social Learning, **Section 6.5.3** examines the Instructor and Instructor Presence, Section **6.5.4** considers the comparisons with Higher Education, Section **6.7.5** discusses the comparisons of Indian and Western MOOCs, Section **6.5.6** platforms discusses the Value of MOOC Certification, and Section **6.5.7** outlines the Challenges faced by learners.

6.5.1 Engagement

As the demographics of the participants in this study were so varied, so too were the ways in which the participants engaged with MOOCs. Studies of patterns of engagement in MOOCs broadly identify a funnel of participation (Clow, 2013), where, as a MOOC progresses, the number of learners are 'funnelled' down to the few who end up finishing the course, at an average of less than ten per cent of the total cohort (Jordan, 2014). See

Section 3.3.2.1 for a more detailed discussion of the patterns of engagement in MOOCs as identified in the literature.

Due to the nature of the participant recruitment [Invitation to Survey Respondents to be Interviewed], and an inherent limitation of qualitative studies of MOOC populations, it is worth stressing once again that the participants who would have gone beyond the survey and chosen to be interviewed in further detail for this study are, for the most part, likely to be grouped into the five-ten per cent of completers, who are possibly actively participating in the MOOC. These respondents may be highly motivated Self-Directed learners that are finding their own personal success within the MOOC and may not necessarily be representative of the broader MOOC population. In fact, the completion rate of at least one MOOC of all survey respondents was 78.3% for FutureLearn (n=277) and 56.4% for NPTEL (n=907).

Nevertheless, an insight into these successful MOOC learners' experience could shed some light into the processes and expectations that help these learners from achieving success in a MOOC and could be of assistance to MOOC developers in being able to design courses to foster more of these successful patterns of engagement.

In this study, the evidence from the survey and the follow-up interviews suggest that the primary intentions of the participant dictated the extent to which they would engage with the MOOC. Learners who took up MOOCs as a hobby, primarily from the FutureLearn sample, had their work or familial commitments often take precedence over MOOC study, while for those for whom MOOCs were a supplement to their higher education, as was more often the case for learners from the NPTEL sample, MOOC study often was a planned and structured activity.

Most respondents said they spent between 1-3 hours a week on MOOCs (27.8% of NPTEL and 35.2% of FutureLearn respectively), and there was no noticeable difference in the time spent between the two samples. Some of the participants interviewed followed a schedule when engaging with MOOCs, often dedicating a day or a particular time of day to the task of finishing that particular week's activities.

Participant29_NPTEL: Every Sunday morning, I try to finish as much as I can because my routine is I will wake up it the same time every day at 6 AM. So be Saturday be a Sunday. So may I get a good 4-5 hours on Saturday or 4-5 hours on Sunday. So that is the time when I try to complete the complete the material which has been put up that week, and I also try to give the assignment, and I do the assignment and everything then and there and get it done.

Participant3_FL: It's largely based on my holidays because I have fixed my schedule accordingly. So on weekdays generally I continue with my college studies and only refer to it (MOOCs) if it is required or something that I know which pertains to this area of my studies. Otherwise, it's mostly just on weekends.

Participant21_NPTEL: I study only on Saturdays and Sundays - first, I watch all the videos released and those keywords that I do not understand I search on Google and assignments are completed on Sundays.

Participant6_FL: They (course providers) give the numbers of hours that we supposed to take during a week like per week we should give at least 3 to 5 hours. So I kind of schedule specific days like Mondays and Wednesdays and Fridays for FutureLearn and the other days are for my own personal college stuff.

As discussed earlier, the participants interviewed likely represent the five or so per cent of MOOC learners that complete MOOCs. It is perhaps not surprising to see that these learners are able to perform metacognitive tasks such as identifying, structuring and regulating their learning through MOOCs. These learners demonstrate high levels of Self-Regulated Learning, a trait that has been identified in the literature as being crucial to success in a MOOC setting (Diver & Martinez, 2015; Kizilcec et al., 2016; Littlejohn et al., 2016; Shapiro et al., 2017). In that some learners were planning their study and roughly following a learning schedule, there were no apparent differences observed between the NPTEL and FutureLearn sample of interviewed participants.

That said, the interviews revealed nuanced patterns of engagement that are worth exploring in greater detail. Some interviewed participants had studied multiple MOOCs, often from a wide range of disciplines. These interviews offered evidence that some of those

participants made a distinction between MOOCs they enrolled in out of curiosity or to build on an existing hobby, and MOOCs they had enrolled in to develop a particular skill, or for a specific workplace or educational purpose. The distinction often led to different ways in which the participants would manage their time around the MOOC, prioritising some courses over others in cases where the workload might have been too overwhelming.

For Participant11_NPTEL, an engineering Post Graduate student:

> If I have taken the basic electrical circuits [course] for the GATE [An Indian entrance examination], it means it will be important. Definitely, there will be a learning strategy. For other courses like I have taken the 'learning how to learn' [MOOC] from Coursera. That is not so much important so that I can study them when I have free time. So depending upon the courses, it will decide how I manage my time around my learning.

Here, the participant recognises courses that will directly impact his future educational prospects and prioritises these courses over courses that he might take out of genuine interest or as a hobby. However, for others, having direct relevance to one's life is not necessarily the only determinant of one's prioritisation of MOOCs. For Participant15_FL, a 45-year-old man who had completed more than nine MOOCs:

> [If] the courses pertain to arts, liberal arts or something, then I take it as when I get the time, but when it is like something to do with big data, something on knowledge management or something related to technology, then I'll follow a particular structure, like I would make it a point to go to the website and do my studies & then follow it up over the weekend. So, I'm more religious when it comes to technical courses.

And for Participant27_NPTEL, a PhD student:

> Participant27_NPTEL: It depends on what kind of course, I [am] taking. For example, even though I am a major in physics, I do have some interest in Philosophy, I do have some interest in Biology, and sometimes I learn programming also. So ... suppose I'm taking a Physics course which is heavily mathematical. I do take a planned schedule. Actually every day I sit for one hour or something with

this time. And I try to mimic the live classroom experience like I watch the lectures, I work out everything on pen and paper. And what are the faculty is writing there on the blackboard. I do copy them. I try to learn it, and when he asked a question, I think it for myself. I pause the video and think the question from myself. I try to figure out the answer then I know I resume the video and see what is answering with. So I tried to mimic the experience.

On the other hand, if it is sort of I say Philosophy video or some other thing which are not that mathematically intense, then I do actually do not make a plan. I watch them whenever I feel like, I mean sort of when I have some free time. I just have nothing much to do importantly. So I just look at them. But the thing is here there also I want to learn, but it's just I don't make a specific plan for my non-major subjects. I specifically plan or schedule for my major subjects like Maths, Physics because that's where my main interest lies.

For these participants, despite taking MOOCs mainly for personal enrichment and growth, they still draw a distinction between 'technical' courses and courses from the liberal arts. Due to the increased workload and challenging assessment tasks often involved with 'technical' courses, these participants would develop different patterns of engagement based on the type, of course, being offered, to improve their own ability to complete the MOOC.

A few of the interviewed participants had an interest in only part of the entire MOOC's offerings, which altered how they would engage with the course. For Participant4_FL, a man in his fifties:

I have a time allocated for online courses, and I try to do it within that time … I devote a certain portion of the day to online courses. I mean the actual listening to the lectures. I don't need, you know, the assignments and all that which I can do later on.

As a lifelong learner not particularly interested in earning certification or completing the course as per the platform standards, this participant follows a schedule to consume the video content of the course, but does not have any strict plans for completing the weekly

assessment, and in many cases, only follows the courses for the video content while considering assessment tasks as secondary and not of prime importance to his learning needs.

On the other end of the spectrum, Participant23_NPTEL was using MOOCs purely to aid his formal studies, and would only take the content that aligned with his college's curriculum, ignoring the rest of the material or the assessment.

> Participant23_NPTEL: I actually study only in the first two months of my (university) semester. I don't refer to it before the exams or something … if I want to build fundamental concepts, then I refer to it (NPTEL) because their basics are very good. You know they teach very well, and they teach the basics and the fundamental concepts very well. And in the later one, means in the second half or you can say the last 20 videos means in the last few videos the course differs from my college. So I can't refer to that.

The idea that MOOC learners sign on to courses just for particular bits of content they are interested in and opt out of all the other content around it is quite a common factor identified in existing literature around MOOC completion rates and learner engagement (de Waard et al., 2015; Hill, 2013; Honeychurch et al., 2017; Loizzo et al., 2017), and has been discussed in **Section 6.3**. As respondents from the interviews, especially from the NPTEL platform, repeatedly identified the need to stick to their curriculum, and with the entire Indian higher education system oriented towards success in exams (Singh, 2015), it is not surprising that some Indian students who are currently in higher education are strategically studying content that meets their curricular requirements, while ignoring the rest of the material, regardless of its usefulness in getting a holistic perspective on the subject, or how well it might have been pedagogically designed.

It is also worth noting in the last line of the above quote that Participant23_NPTEL states that he *can't* refer to NPTEL because the content is not relevant to his course. In this way, MOOCs could be seen as reinforcing the existing emphasis on rote-memorisation of higher education in India (ibid. p.2), while potentially stifling any curiosity or further interest-driven exploration of content beyond the scope of the particular exam the students are preparing for. While this certainly isn't a problem unique to India, with the

aforementioned challenges facing higher education in India as mentioned in **Section 2.5.2**, there is a question as to whether MOOCs could play a more significant role in tackling these issues. It raises the broader issue, should MOOC platforms compromise on their own course design to facilitate learners' specific curriculum-related needs, or should there be systemic change within higher education in India to move away from rote-based learning. A case could be made to move towards a more holistic approach to learning that doesn't penalise learners for exploring beyond the curriculum and learning through different contexts, such as those found on Western MOOCs. Such questions are beyond the scope of this study, but nevertheless, these findings highlight how some Indian learners, mostly from the NPTEL platform, are not using MOOCs to their full potential, but rather reinforcing the existing norms of higher education in India, of memorisation and a focus on examinations (Singh, 2015, p. 6).

Lastly, there were quite a few interview respondents who had enrolled in over nine MOOCs to date. These learners were more likely to be from the FutureLearn sample (22.5%) than the NPTEL sample (8.6%). In terms of completion, defined as having completed at least half or more of the course content or earning a certificate on the MOOC, the gap between FutureLearn and NPTEL broadened further. 10.4% of the FutureLearn survey respondents claimed to have completed 9 or more MOOCs, compared to just 2.1% of NPTEL respondents. For these dedicated MOOC participants, learning was 'addictive', and these learners would essentially 'binge-watch' (Davis, Chen, Hauff, & Houben, 2016) a course's materials whenever they would have the free time.

> Participant1_FL: It was addictive learning, every time whenever I found a little bit of time then I consulted that course and started learning in my house and whenever I got any time a little bit of time I started learning.

The concept of binge-learning through MOOCs was experimented with at one point, with one of the largest MOOC platforms, Coursera, implementing a Netflix-like monthly all-you-can-learn subscription fee, allowing learners to 'binge' on as many MOOCs as they wish from their entire catalogue of courses (Shah, 2017). For learners such as Participant1_FL, as well as the 255 survey respondents who claimed to have finished nine or more MOOCs (173 on NPTEL, 82 on FutureLearn), this would likely have been a

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welcome move, and potentially cheaper as well, in the long run. However, for every learner like Participant1_FL, there are potentially dozens of learners that don't have the means, time, or commitment to follow through and get their money's worth through the monthly subscription. More importantly, this raised questions about the real value of a MOOC certificate if learners can potentially get a number of them in a relatively short period of time, especially given the cheating that typically occurs in MOOCs, as discussed in **Section 2.2.3** . In Coursera's case, after piloting the catalogue subscription model for six months, it was scrapped and is no longer offered as an option (Sidel, 2017). It is unclear why the model was scrapped, but it did briefly show a willingness to cater to the *MOOC addict*, which may have been too small of a fraction of their userbase to remain sustainable[25].

In summary, this section outlined how Indian learners on both NPTEL and FutureLearn engage with MOOCs. Most NPTEL and FutureLearn respondents claimed to dedicate 1-3 hours per week to MOOC related activity (27.8% of NPTEL respondents and 35.2% of FutureLearn respondents respectively).   While there were no apparent differences observed between the broader NPTEL and FutureLearn interviewed learners, there was a close relationship between their patterns of engagement with the MOOC and their primary intention for taking the MOOC. For instance, learners that were taking MOOCs more as a hobby or for leisure purposes, who statistically tended to be more from the FutureLearn sample, were more flexible with their MOOC learning, working them around their lives, but many of the respondents, on both NPTEL and FutureLearn, had a schedule and dedicated time allocated to MOOC related work, demonstrating high levels of Self-Directed Learning. Some interviewed participants tended to differentiate their engagement with MOOCs between courses taken as a hobby compared to courses taken for a specific career or educational need, having a more structured approach for the latter. Some learners from both the NPTEL and FutureLearn sample seemed to confirm findings from existing studies (de Waard et al., 2015; Hill, 2013; Honeychurch et al., 2017; Loizzo et al., 2017) in being able to pick and choose specific sections of the course relevant to their

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[25] It should be noted that as of late March 2019, FutureLearn has adopted this subscription-based service, but as it is a fairly new development, discussion of this was not included in this study. However, mention of this economic model is included in the Conclusion.

needs, and were not bound by the broader structure of the MOOC. This, however, suggests that learners, particularly from the NPTEL sample, are reinforcing the existing norms of higher education in India, and not making use of the affordances of MOOCs to go beyond the rote-based learning approach common within higher education and trying to learn within the constraints of the curriculum. Lastly, while a few learners claimed to have completed 9 or more MOOCs (10.4% of the FutureLearn sample compared to 2.1% of the NPTEL sample), in the broader scheme of MOOCs, these learners represent a tiny minority of 'MOOC addicts', who, while still of interest, are not representative of the average learner and their engagement with MOOCs.

6.5.2 Social Learning

Interaction between learners as well as with the instructor (Kalyuga, Chandler, & Sweller, 2001) form an integral part of the learning experience in traditional learning settings, and thus this study explored to what extent learners engage socially within a MOOC setting, how important such social interaction is to these learners, and whether there exists a difference between the social interaction between learners on FutureLearn and NPTEL.

There has been evidence to suggest that MOOCs are for the most part an isolated experience (Stanford University, 2013), but there have also been groups of learners that do engage socially both within the MOOC platform, and through special groups on other social media platforms (Veletsianos et al., 2015). The FutureLearn platform, in particular, has been developed to foster social learning, using a social-constructivist pedagogy based on the Conversational Framework (Chua et al., 2017; Ferguson & Sharples, 2014; Sunar et al., 2017).

The survey results suggested that there was no statistically significant difference between the NPTEL and FutureLearn sample in their feelings towards interaction with other learners, yet the interviews suggested otherwise, as many of the participants that were interviewed, especially from the NPTEL sample, felt that learning on a MOOC was an isolated experience, and that wasn't necessarily a bad thing. However, some of the participants interviewed had unique experiences of social learning through MOOCs. This section will discuss some of the ways in which these interviewed participants were

engaging in social acts while participating in the MOOC, and to what extent they valued these interactions.

As pointed out by Veletsianos, Collier and Schneider (2015), some MOOC participants take their learning experience outside of the learning platform into social networks like Facebook, providing a less formal environment to have course-related discussions. For Participant15_FL, a 44-year-old technologist from Delhi, his interactions on a MOOC led to him creating an entire community of learners around that topic:

> I participated in discussions, and I did a course on Coursera [called] art & inquiry...museums, learning in the museum - teaching strategy for your classroom. So based on that I created a group on Facebook, and there are around 150 people who are related to museums & art galleries are there

He goes on to discuss how creating the group gave him the opportunity to interact with a wide range of people from various walks of life, all with the common interest in museums. While most MOOC platform discussion forums provide a space where learners can choose to remain anonymous, Facebook connects learners' online identities with their real ones. There certainly are risks associated with identifying yourself to a group of strangers on Facebook, most notably in the case of MIT professor Walter Lewin, who used Facebook groups of MOOCs he offered on edX to prey on and sexually harass female students (Straumsheim, 2015). Nevertheless, this could be considered an aberration at best, and as in the case of Participant15_FL, the Facebook group was an overwhelmingly positive experience for him, and allowed him to connect with people in the same field of interest, and build an informal network outside of the confines of the MOOC platform, and outside of the time-bound rigidity of the course duration.

However, the creation, curation and maintenance of such a group is an active and time-consuming process, and without appropriate prompts and guidelines, can lead to the groups stagnating, or becoming inundated with non-relevant spam (Sanzgiri, 2013). This was the case of Participant29_NPTEL:

> We tried to form a WhatsApp group, but I don't know, somehow there was very little communication between students, nobody even bothered to answer other's

queries. So it has to be ultimately the teaching assistant who has to answer. It was very rare cases that I found that people used to discuss with each other or give a reply to somebody else's query. That element was completely missing.

The researcher's Master's thesis focused on a community of UK-based MOOC learners that primarily communicated through a Facebook group, yet, found that while many learners are interested in being a part of the group and willingly sign-up to these groups, actual engagement in the group was incredibly rare, and often needs a core group of members to steer meaningful dialogue, and keep the discussion going (Sanzgiri, 2013, p. 69), with another study finding similar low rates of actual participation with "no deep, course-related interactions" (Z. Zheng, Vogelsang, & Pinkwart, 2015, p. 502). In some cases, MOOCs have official groups that are moderated by either members of the instructional team, or by volunteers within the community. These groups have better engagement and are well received, as they are continually being monitored by the moderators, with MOOC instructors often joining in the conversations (S. Zheng, Han, Rosson, & Carroll, 2016), but still, there are a large number of learners who will sign up for a group, but never comment or add to any discussion within the group, lurking in these forums despite taking the additional step in seeking out specific spaces of discussion of a particular MOOC.

The NPTEL learners interviewed, seemed to be, on average, less motivated to engage in discussions online, however, as in the case of Participant5_NPTEL, a 21-year-old undergraduate student from the state of Andhra Pradesh, learners may be using more traditional forms of group learning with the NPTEL materials. This participant discusses how he and three of his friends, all studying at the same university use NPTEL. They collectively decide on which course to study, watch the video content individually, but then meet up weekly to do the assignments and problem sets together. As NPTEL MOOCs follow the Indian curriculum, this allows groups of learners already present on campus to spontaneously form into small study groups, using the MOOC as a structure to frame their weekly study-time with. In this way, they keep each other motivated through the course and use the group sessions to learn from each other by working through the problems as a group.

Similarly, Participant6_FL made friends with two other learners from Sri Lanka and together formed a support group to keep themselves motivated and engage in discussion.

> I am currently doing a course with my friends. Two friends who were in Sri Lanka right now. And I've like talked to them that we will all do a course today - just because we can't study together in the same country. We can do an online course together. So we're doing criminology, forensic science course in FutureLearn. It's still going on - we've paused it because they have their exams right now in their law degree.

When asked how they manage their study group, she says:

> We follow each other in all the comments section. We follow each other [on FutureLearn]. Then we assign modules and finish them. We put each of our own views about the module in the comment section. So we can actually see what our friend has commented. So there if I follow my friends, I can see all her comments. So I know what she learned from that module. She does the same thing, she knows what I learned from that module and we come to WhatsApp separately, and we chat about what we liked about it.

In this way, these learners are using the functionality of FutureLearn to 'follow' certain people to distinguish their posts among the thousands of posts in each discussion section and keep each other motivated through chats on WhatsApp. This blended use of various 'closed' and 'open' social spaces to stay connected and learn as a group provides insights into how some learners are making smart use of social networks to keep themselves motivated to persist through the coursework.

For some of the participants, taking part in a MOOC gave them the ability to engage with learners across the world. According to FutureLearn participant18_FL:

> When I go on the site[FutureLearn] ...I get to meet a lot of people, meet in a sense, chat with them online, the people from other countries, and you know come to know about the culture there and what are the practices and their perspective of whatever is happening.

Similarly, for participant3_FL:

> Being in India and being in a university which has mostly Indian students - I'm not
> open to the ideas a person living in Australia would be able to give according to his
> environment, the surrounding or what he observes in his society. So when I'm on
> FutureLearn or say Coursera or edX ... it gives me a better idea about the world, and
> that is what makes it overwhelming because there's no restriction of ideas which
> ones has to face being in a university or being in a college where there are not many
> foreign students. So it gives me an overview of not just say Indian society it allows
> me to get into the ideas of people from Australia, US, UK, Pakistan, Nepal from
> everywhere and that broadens my mindset.

This participant continues to lament the state of Indian higher education more generally,
saying:

> We [Indians] are not open to many criticisms. Actually, our education system has
> been designed such that we do not criticise much. We tried to mug up [memorise]
> things; we tried to get the information and just write the information in a weak
> sense. What FutureLearn and especially the comment section allows us to do that
> - We learn how to criticise, how to analyse things. Which we do or have an
> opportunity to do in the college stage only because after stepping up into the
> college one thing that I've learned is that until you analyse and learn to conclude
> on the basis of that analysis, your work is not finished. So that is again a way in
> which because in the Indian education system is such that it does not allow you to
> analyse much, it allows you only to get the information and write whatever you
> have learned. So it is a hindrance, and that hindrance clearly isn't present in the
> online courses.

For this participant, learning on a MOOC provided him with an opportunity to interact
with a broad range of views, which he felt was limited at his home institution. In this sense,
the MOOC acted as a gateway to ideas that do not necessarily conform to the social norms
of the participant's culture. This is especially pertinent to the comparison between the
platforms of FutureLearn and NPTEL, as NPTEL, being a primarily Indian platform bound
by Indian curricula, rarely attract learners from other countries, while FutureLearn remains

a truly global platform with a multiplicity of views and ideas. In this sense, NPTEL learners are missing out on one of the potential benefits of MOOCs, to be able to connect with learners around the world, and are not getting the same exposure to ideas and beliefs different from theirs that the learners from FutureLearn are.

There have been arguments made by researchers that MOOCs represent a form of neo-colonialism (See **Section 3.4**), promoting dominant Western ideas and not paying enough attention to alternate and Eastern viewpoints (Altbach, 2014; Wahyudi & Malik, 2014). However, such a view implies that learners are passive consumers of MOOC material and are unable to differentiate and recognise competing views, or that there is nothing to be gained from understanding Western ideas. In a country such as India, where a vast majority of the population has limited access to higher education (FICCI, 2014), this argument could potentially hold true if MOOC learners were a general representation of the actual population. However, the current study indicates that Indian MOOC learners tend to be well educated and, as the above quotes from participant18_FL and participant3_FL demonstrate, are able to assess different points of view and perspectives critically. Indeed, Participant3_FL reveals a strong desire for being able to access different points of view in order to be able to come to a more informed understanding of the subject matter being studied.

There is not an easy solution to the challenge of neo-colonial tendencies of MOOC content and pedagogy, and it harkens back to the term used by Altbach (2014). He calls this phenomenon the 'neocolonialism of the willing' – where MOOCs are a natural product of the academic culture from which they have emerged, and unlike colonialists, have no desire to impose their ideas and methodologies upon others, but it is something that just tends to occur organically as MOOCs grow in popularity. Instead of being critical of, and apprehensive towards Western ideas, the interviewed participants mentioned above tended to cherish the opportunity to engage with learners and ideas outside of their own society and felt this was an essential dimension of their experience with the MOOC.

Participant6_FL addresses a further dimension of the perceived benefits of MOOC study for Indian learners, lamenting that unlike in the West, there is no culture of social interaction embedded within the higher education system in India, and therefore MOOCs

provide an avenue for discussion for those who want to engage with their learning critically:

> Actually, when you're in the class, you don't get to know people's views on whatever class that they teach right? So people usually are shy. They leave the class; they don't even talk to others. So, knowing that, after every module that I finish [On FutureLearn], I read the discussion forum twice or thrice, I just read a lot of comments in the discussion forum, no matter how much ever time it takes.

The challenges of promoting discussion and social learning in India became clear when discussing social learning with learners from the NPTEL sample. When asked about their need to interact with other learners, many were sceptical of any benefit that could come from social learning, and for some, the discussion forum was merely a place to ask queries or solve doubts that one might have about the course content, preferring to speak directly with the instructors than with members of their cohort:

> Participant22_NPTEL: With other learners, I don't think [interaction] is that much important, if there are interactions with other learners, it is fine, but mainly the interaction with the instructor is the most important, he has the knowledge, and he can explain everything there ... If I am going through a course so if I got any problem then obviously I'll speak to the instructor because the other learners I don't know them. So, how can I be dependent on them?

And as is symptomatic of the ultra-competitive nature of Engineering and Science degrees in India, one participant was suspicious of the motives of some of the other commenters:

> Participant29_NPTEL: Somehow, I saw that maybe people are trying to compete with each other. If I tell him something he might gain more knowledge, he might become more acceptable than me in the industry. Somehow I felt that this is the way [it is] going on.

These findings highlight the differences in the perceptions of some interviewed participants from the FutureLearn and NPTEL samples towards interaction with other learners in MOOCs. It is worth noting though, that the analysis of the survey responses found no significant difference between the perceptions of FutureLearn (M = 3.8935, SD =

1.11925, n = 358) and NPTEL (M= 3.7292, SD= 1.25503, n = 1540) respondents on their ability to interact with other learners, and their perceptions could be argued to be very favourable towards social learning (See **Appendix 15** for Histogram Comparisons). One possible explanation of this discrepancy is potential acquiescence bias of survey respondents (Hinz, Michalski, Schwarz, & Herzberg, 2007), that is, the tendency of survey respondents to provide generally positive answers to items on a questionnaire.

Part of this difference could also be attributed to differences in disciplines. Many of the participants on the FutureLearn sample had taken MOOCs in the arts and humanities, compared to the almost exclusively science and engineering focus of participants from the NPTEL sample. This disparity across different academic disciplines has been observed in the case of OERs and their adoption (Coughlan & Perryman, 2011), and courses in arts and the humanities arguably have greater scope for discussion, interpretation and critical thinking than STEM courses.

Lastly, part of this lack of engagement on NPTEL could be explained by the ways in which the discussion forums are set up compared to the social layer on FutureLearn (See **Section 2.7** for a comparison). On NPTEL, the discussion area is separate from the course content, and redirects to a Google Group set up for the particular MOOC. Further, there are no prompts for learners to engage with the discussion forums, and for a handful of courses that were examined, there was a complete lack of activity in the group. On the other hand, FutureLearn has comments and discussions embedded within each of the 'Steps' of the MOOC, and often include prompts from the instructors, from threads to introduce yourself to your fellow learners, to tasks involving discussion and debate of a topic. These differences are likely somewhat responsible for the drastic difference in the interview responses between FutureLearn and NPTEL participants, even though the survey results show both groups perceiving social interaction with other learners as very important to their experience of a MOOC. Nevertheless, this discrepancy does highlight the usefulness of the mixed-methods approach, in getting a more nuanced understanding of some of the learner perceptions on social learning, that either method would likely not have uncovered by itself.

In summary, while the survey responses indicated no significant difference between NPTEL and FutureLearn on their ability to interact with other learners, the interviews revealed unique patterns of engagement and attitudes towards social interaction within MOOCs. Learners from both FutureLearn and NPTEL have made attempts to create social spaces for dialogue about MOOCs or subject areas related to MOOCs on third-party social media such as Facebook and WhatsApp. These findings align with those of Veletsianos et al. (2015) who also found learners using spaces outside of the MOOC platform to interact with learners. These findings are of particular importance to MOOC researchers in general as much of these attempts at engagement, both positive and negative, are hidden to those investigating the data generated purely within the platform, and makes a case for more qualitative research in this field, to explore how learners interact within MOOCs. The study also found that it wasn't just online spaces that learners interacted with one another, especially in the case of NPTEL, courses that are designed and mapped against existing for college-level courses across India. One of the participants shared a study group he created at his campus at a smaller institution in India, where a group of friends get together to discuss the course assessment and content, while individually studying the course material at their own leisure. These forms of group work can be seen to be highly motivational to these learners and could assist them in persisting with the courses, more than learners that choose to study in isolation.

Some participants from FutureLearn noted of particular interest to them was the ability to engage in a global classroom and being able to both read and contribute to discussions with learners around the world, something they likely would never have the opportunity to do at their local institution. While there has been concern drawn in the literature around the imperialistic and neo-colonial aspects of Western MOOCs for developing world learners (Altbach, 2014; Czerniewicz et al., 2014; Wahyudi & Malik, 2014), some of the learners interviewed said it was precisely the Western perspective that was what they were craving, and were able to critically evaluate the positions of the course with their own cultural worldviews. This global perspective was considerably lacking in the NPTEL sample, as the platform itself mostly caters to an Indian audience, and hence these learners have potentially missed out on a deeper, more holistic understanding of the subject areas that they study on these MOOCs.

Participants also highlighted how traditional higher education in India doesn't foster significant social interaction among learners, focusing more on rote-based learning (Singh, 2015), with the sole purpose being to pass the exam of the course. While a FutureLearn respondent was frustrated by this and appreciated the opportunities provided by platforms like FutureLearn to engage with other learners, NPTEL participants were far more circumspect in their acceptance of discussions. Some felt that instructors would be better off answering queries and holding discussions, rather than other learners, while another learner was openly hostile to the notion of interacting with other learners, suggesting that doing so would jeopardise his position within the class ranking system, and might affect his future performance on the course. Indeed, a lot of these differences can be partially attributed to the differences in disciplines and their more general views on discussion and student interaction. That being said, as the survey results contradict some of these more polarizing opinions discussed in the interviews, there is also a question as to how representative these views and perceptions are amongst the broader Indian MOOC learner population, and certainly more future research would help in exploring the more nuanced nature of social interaction among Indian learners in MOOCs.

6.5.3 Role of the Instructor

While the participants were mostly positive about the content and design aspects of MOOCs, some participants noted the vital role played by the instructor in both the physical classroom as well as the MOOC environment. As IITs have a reputation as being at the pinnacle of Indian higher education, some learners were incredibly grateful for the opportunity to learn from some of the most famous professors in the country.

> participant27_NPTEL: The beautiful thing about this NPTEL is because you know the course is taught by really well-known professors, not some ordinary professors or some who is very new … So even though they cannot physically teach me, like, they cannot come to [my University] and teach a course here, but I still get to learn their experience I still get to learn from them through these videos. So, I have both the things: I took a course in my own classroom, and I took a class and course from a world-class professor. So learning that like we always want to learn from big guys. I mean people who have done a big thing on their field and they are teaching the

same thing. So that's the thing NPTEL has given me like because personally I have taken a couple of video courses and I personally like say B. Radhakrishna classical quantum mechanics courses are very popular course. I always love that and then recently I downloaded a course of from NPTEL that is atomic physics course but taught by P. C. Deshmukh so those are the kind of things we, I mean, I would never learn otherwise, I mean I have huge respect for these faculties, and I always find [it] exciting to learn their own courses.

Even though NPTEL survey respondents were statistically more likely to have perceived insufficient contact with the instructor or tutors compared to the FutureLearn sample (U=198000.5, Z=-2.773, p=.006 two-tailed), this learner was more inclined to compromise on some of the pedagogical and technological challenges a low-budget MOOC platform like NPTEL has, in favour of the ability to learn from the professors at the IITs. The notion of the 'star professor' that teaches the MOOC was quite prevalent through many of the interviews, not just for the IIT professors, but also some renowned scholars from the FutureLearn courses. For participant13_FL, an English teacher at a private school from the southern state of Tamil Nadu, it was the ability to learn Shakespeare from the world-famous scholar Johnathan Bates on FutureLearn that made her sign up for the MOOC. While the survey did not ask participants specifically about the prestige level of instructors, accounts such as the ones described above suggest that there is possibly a role for the 'star professor' to play in the Indian context, even though such notions were met with scepticism and resistance in the West (K. Hartnett, 2013; Lewin, 2013).

Despite an evident appreciation of the status of the instructor, participants in many cases were disappointed at the lack of engagement and interaction they could have with the professor and the teams running the courses.

> Participant6_FL: If I could add something to FutureLearn, I would probably suggest more attention to the comments that people post. I know that there are many courses that people follow and it's hard for them to, you know, reply to each and every one. But I guess more lively charge of the staff or more often than what they do right now would be better. So staff would know they are expecting and what they are supposed to do to make the course easier.

Participant4_FL: Some of the course designers, they kind of just made the course and walked away. So if you had a query or suggestion or there is a mistake in the course, and, you know, there was no way to communicate with them and those courses, even though they are very good. Obviously, when you do not have two-way interaction, it kind of diminishes the value of the course. That is not to say that interaction is always needed. Obviously, there are certain courses where virtually no interaction is needed. So I'm not counting those. But in a couple of courses I took, they had actual errors in the courses, and there was no way to let them know because there is nobody listening from the other side. And I found a few months later also the mistakes are not being corrected.

While this learner identified faults with the course material, he could not communicate them to the course organizers to have them rectify the mistakes. It is unclear how common such experiences are on FutureLearn, but having open channels of communication to provide feedback to the course team would have been beneficial to these learners.

Despite the challenges faced by instructors of interacting with potentially thousands of learners in a MOOC environment, some participants were nevertheless appreciative of efforts made on the part of some instructors in trying to engage with their learners.

Participant12_FL: There was a session to connect to the tutor, which they do every one or two months. They'll arrange a conference call with the tutor, and the other participants will join the call, and anyone who had the doubt came also. Personally, I liked that the most.

A number of instructors on MOOCs have attempted varying strategies to communicate with their learners, leveraging social media such as Google Hangouts, responding to Twitter feeds (Parr, 2013) and engaging on official Facebook groups (S. Zheng et al., 2016), while others have conducted "virtual office hours" (Bruff, 2013), and in some cases, physical meetings with students at specified locations around the world (Sanzgiri, 2013). Such strategies are usually welcomed by learners as it fosters a closer connection between the learner and the instructor, something that is often missing, particularly in the case of the NPTEL MOOCs.

While appreciating the benefits of the online mode of learning, participants still noted the value of a teacher in a face-to-face setting:

> Participant12_FL: Online it's always there, so whenever we are looking for a lot of content, it can redirect to a lot of places where we have the right resources, but when we have a teacher they can easily, you know, it will help us to reduce our learning time because that tutor knows which place we are supposed to go.

> Participant29_NPTEL: [At University] when a professor used to clear our doubt it was then and there. And in face to face, I can go into any level of discussion with the professor. I was actually known for this that I used to engage them in a lot of discussions, something which is very limited on the e-mail platform. There's a limit to it means how deep you can go, and the professor in face to face understands the student completely, especially in professional colleges. Where they are teaching, you are sitting in the class, so they know how much you know, how much you don't know. But here (online) the situation is a bit difficult because professors will not know what my background is, they will not know what my thinking process is. So it's a bit difficult for them.

Participant8_FL, herself a teacher, identified this exact same shortcoming of MOOCs, from a teacher's perspective:

> The fact that you see the teacher in front of you and you can interact is lacking. When I was in the class, and when I was with the students, I could make out from their expressions or even from their gestures you know - What it was, whether they had a question whether they had a doubt whether they kind of comprehended or not. Similarly, they could see from my expression and everything else, what I am trying to convey. But here probably only the video exists, which can do that but still, it's entirely different … to the face to face experience.

While the lack of instructor presence in MOOCs is a known shortcoming of this form of learning (Hew & Cheung, 2014; J. Knox, 2014), as some learners from India have already shared their apprehensions about engaging with fellow learners in a MOOC, as discussed

in **Section 6.5.2**, there may need to be a middle-ground drawn, between instructor and learner interaction in order to assist learners with their journey through a MOOC.

In summary, while both NPTEL and FutureLearn learners surveyed felt that opportunities to interact with the instructor were a very important factor in their experience on a MOOC, in reality, many of the participants interviewed were left wanting a greater interaction with the instructor or tutor than what they received on the MOOC. Learners, particularly from the NPTEL sample, but also from FutureLearn, recognised the value of the 'star professor' from the prestigious institutions the MOOCs were being offered from, and were appreciative of the opportunity provided to them by MOOCs to learn from the best professors in their respective disciplines, but felt that more could have been done by these professors to interact with the learners on the MOOC. While there was no difference found between the responses of learners on the FutureLearn and NPTEL sample, both valued interaction with the instructor more (NPTEL M= 4.0191, SD= 1.1150, n=1540 and FutureLearn M= 4.0503, SD = 0.9867, n=338) than interaction with other learners (NPTEL M= 3.7292, SD=1.2550, n = 1540 and FutureLearn M= 3.8935, SD=1.1192, n=338) (See **Appendix 15** for Histogram Comparisons). This could have greater implications for MOOC designers considering a focus on Indian learners, to focus more on perceived engagement with the instructor, rather than prioritising engagement with other learners. While this may not always be possible with the thousands of learners that are active on MOOCs, instructors could certainly do more to grow their presence on the course, beyond just the figurehead delivering course content, as in the Indian context at least, learners value the prestige of the professor as much as the institution she hails from.

6.5.4 Comparisons with Higher Education

At the height of the hype surrounding MOOCs, they were touted as disruptors to the current higher education system in the West (A. Agarwal, 2013; Koller, 2012; Leckart, 2012). However, critics and later research (Zhenghao et al., 2015) confirmed this not to be the case, and far from disrupting higher education, there have been persistent attempts at embedding MOOCs within the existing system of higher education, through 'flipped MOOCs' (Bruff et al., 2013; Delgado Kloos et al., 2015; Israel, 2015; Pérez-Sanagustín et al., 2017) where learners study MOOC content at their own pace and use classroom time for

discussion, through offering credit through MOOCs towards an eventual full degree at a formal institution (Lewin, 2015), or through the recent trend of offering entire degrees through MOOCs (Pickard, 2019; Shah, 2018). Beyond formal education, MOOCs also seem to have pivoted towards more workplace and skills-based learning (Reich & Ruipérez-Valiente, 2019). However, while these critiques and studies focused mainly on Western education systems, Western learners, and Western platforms, this study aimed to provide the perspective of the Indian learner. As outlined in **Section 2.5.2**, there are a number of serious challenges facing the Indian Higher Education system, from a severe shortage of teachers to poor quality of teaching and learning at many institutions. These were all challenges MOOCs were posited as a potential for addressing. This section will discuss how Indian learners compared their experience with Indian higher education with their experience studying on MOOCs, and what were the differences in their experiences with FutureLearn and NPTEL.

With the wide-ranging demographic profile of participants, it was expected that participants would have equally diverse experiences of higher education and would be divided in how they compared their higher education with their experience of MOOCs. Yet, interviewed participants from both platforms revealed that their experiences with higher education were poor, and that MOOCs represented a significantly better experience, both in terms of quality of content, as well as the pedagogical structure of the courses themselves. These views were more widely expressed by learners from FutureLearn, which seem to align with the survey results, which found a statistically significant difference in the importance that learners from the FutureLearn sample gave to the quality of the MOOC, compared to the NPTEL sample (U=287359.5, z=3.270, p=0.01 two-tailed).

For Participant4_FL, a 56-year-old man, speaking about what benefit he sees in FutureLearn:

> There is ... absolutely no comparison between the way I was educated in college and what is going on today. In fact, that is the reason I am so enthusiastic about it, because this what I wanted but never got, never got an opportunity to learn in this

way and quality of the people who are teaching and you know the lectures, the content.

Similarly, a 20-year-old woman, participant6_FL, mentions how she prefers online learning to traditional book-based education:

First of all, I don't like studying, I don't like sitting in front of a book, and I don't like reading it line by line. It takes a long time. A lot of time. I find it boring, irritating. But taking an online course has made me listen to lectures - you have audio with it, and you're listening to teachers, or meeting new people in a discussion forum.

Lamenting the certification-driven mindset of some Indian learners and comparing it to learners from the UK, participant26_NPTEL mentions:

The students here (in India) don't do education like they are doing in the UK. They don't want the experience. They don't want to learn. They just want a tag. They want just tag that I have done this diploma from IIT Madras. They want just tag that I have done this diploma from IIT Delhi - they don't want to learn.

This sort of view of MOOCs as an avenue for certification is somewhat supported by the survey, which found a statistically significant difference in how much importance the NPTEL sample of learners gave to certificate (U=231766, z= -2.980, p=.003 two-tailed) in contrast to learners from the FutureLearn sample, suggesting the value of the certificate means more to learners on NPTEL than FutureLearn. While participant26_NPTEL's statement might seem a bit sweeping, it does reflect a frustration held by some in India about the overly-competitive nature of higher education.

While NPTEL, with its limited budget and low-tech solutions to deliver MOOCs to Indian learners, may not live up to the same quality standard of Western platforms, surprisingly, some learners who took their courses still found them to be better than the provision offered by their formal institutions. According to participant25_NPTEL, a 21-year-old male undergraduate student at a smaller engineering college in southern India:

In college, [the] degree is very boring - there is no real-life experience. I mean there is no real-life example … they only enter the equation, that's all. In NPTEL it is not like that – For example, they say the fluid is flowing like that, How come, why, what, when these 5 words very common in NPTEL. Each and every equation they tell how, when, where, like that. … There is a very large difference in my university exam, University teaching and NPTEL teaching there is a very large difference. I feel very happy to learn from NPTEL.

This suggests that learners like participant25_NPTEL are able to identify the shortcomings of their formal learning as being 'equation' driven and rote-based (Singh, 2015), while the MOOCs they take makes them think critically and question every assumption. This shows the potential of MOOCs to develop critical thinking skills amongst learners in India, an area that is currently severely lacking (Mehta & Pandya, 2015, p. 219) within the higher education sector, but also highlights the poor state of teaching and learning at smaller universities in India, where NPTEL MOOCs are seen as considerably better in quality, despite the pedagogical and design limitations that have been highlighted in **Section 2.7.1.**

When asked to reflect on their own experiences, participants were often willing to provide their perspectives on the Indian Education system and some of the systemic problems they perceive as besetting the system. The quality of instructors was often cited as a significant challenge, as participant23_NPTEL highlights:

There are some colleges, like mine, they don't have many experienced professors. There is an instance in my college that actually to teach B. Tech. students you have to be PhD, but this never happens in private colleges in India … The students that are pursuing M. Tech. are teaching the B. Techs. So, you don't get that much experience, and also good professors are not available at every place like every college, so that's really where NPTEL can be of use.

Highlighting the issue of faculty shortage, participant30_NPTEL says:

… In India, except for IIT and NIT [National Institutes of Technology], there is no staff. Nobody can teach better. The main problem of all the normal colleges except IIT and NIT is the lack of staff. They have a lot of infrastructure, lot of money, lot

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of government funds, but they are wasting their resources ... (and) not thinking about the teachers. Hence all my needs must be fulfilled by NPTEL.

All my teachers watch NPTEL content first. They understand through NPTEL and then they come to teach us ... Because the person who teaches us is learning from the NPTEL, so what do we do? We just bunk[skip] the lectures and see the NPTEL videos [instead].

This participant, frustrated by the poor standards of teaching at his institution, candidly admits to skipping classes and learning all the content he needs from NPTEL Also of interest is the fact that instructors from these smaller institutions are using NPTEL content to train themselves and guide the teaching of their own classroom. How prevalent is this phenomenon remains uncertain, but the fact that learners have been able to identify the instructors' teaching methods, and have effectively bypassed the lecturer and skipped classes to learn directly from the source once again highlights not just the poor state of education in India, but also the unique ways in which learners from smaller institutions have taken agency of their learning and are meeting their learning needs through NPTEL.

In summary, this section outlined some of the ways in which Indian learners from NPTEL and FutureLearn compared their experience learning on a MOOC, with their own experiences of higher education in India. Learners from the FutureLearn sample were more vocal in their critique of the system they had studied through, with one elder learner in his fifties remarking that he had never experienced such an enriching and high-quality learning experience in his entire life, and was immensely grateful of the opportunity provided by FutureLearn to be able to gain knowledge through these MOOCs. This emphasis on the quality of learning from FutureLearn respondents corresponds with the findings from the survey, where learners on FutureLearn were significantly more likely to give importance to the high-quality nature of the learning resources on MOOCs, compared to the NPTEL sample (U=287359.5, z=3.270, p=0.01 two-tailed). That being said, despite the comparatively low-budget and low-quality teaching and learning taking place on NPTEL, some interviewed participants argued that compared to the level of instruction they were receiving at their universities, the materials on NPTEL, borrowed from the IITs, were still

of considerably better quality, allowing them to think more critically about the topic, compared to the rote-based learning approach employed at their universities.

NPTEL learners interviewed tended to be more included towards certification as a measure of success with MOOCs, which was in line with the findings from the survey that identified a statistically significant difference in how much importance the NPTEL sample of learners gave to gaining a certificate (U=231766, z= -2.980, p=.003 two-tailed) in contrast to learners from the FutureLearn. As the learners from the NPTEL sample tended to be students currently enrolled in some formal degree, they were also more vocal about their immediate frustrations with the poor standards of teaching at their institutions and were able to identify critical challenges that face Indian higher education as a whole. As the Indian government attempts to integrate MOOCs such as those created on NPTEL within the formal system of higher education, instructors were also using these courses as a framework, in a flipped sense, to assist in their teaching and learning. However, instead of improving the state of teaching and learning at their institutions, at least in one instance, learners caught on to the fact that the instructor too was using NPTEL resources for his reference, and instead of using the flipped classroom approach for more critical discussion, decided to skip all his lectures and access the material directly through NPTEL. This suggests that while there is tremendous potential for NPTEL courses to be used within Indian higher education, instructors need to be adequately trained in how to deliver courses through a flipped MOOC format, instead of merely repeating the video materials found on NPTEL and not engaging in any more in-depth dialogue with the learners.

6.5.5 Comparison between MOOC platforms

While many learners interviewed had taken MOOCs on just the platform they were recruited from, FutureLearn or NPTEL, some had taken MOOCs from other providers as well, and would share their perceived comparisons between platforms. This was useful in providing a sense of some of their perceptions over platform-level differences and making sense of how they valued different platforms and their experiences on it.

participant19_FL spoke about differences he felt between the FutureLearn and Coursera platforms

> Coursera had an American feel to it ... mainly the spread of courses; mainly, it was career-oriented in that sense, that's the sense I get from Coursera. But in FL I got that if you are interested in a topic, whether it is related to your career or not, you can learn it in you know FL, that the sense I got. So In Coursera, I did things like gamification, game theory and stuff like that which I hope to apply in my career. Whereas in FutureLearn, I did this course on Gravitation, gravity fields, because I'm interested you know and then I'm in mid-way through this course about programming, visual programming using processing. It just my interest, it may or may not have any application with my career, but I don't care you know I just like learning. So I think FL has breadth of content, very diverse sort of content. I sort of like that for that aspect.

Similar views were shared by participant8_FL:

> What I like about FutureLearn is, you know, the variety of interest that they kind of take into account, not that edX and Coursera don't. Then I think it is my personal kind of, you know, response and so I find the focus on literature fascinating, because I was a student of English and Shakespeare, and then recently those other courses about mental health and digital reading and all those kinds of things, you know ... and EdX is very professional, and I have kind of registered for some of them but I know I'm not kind of applying for a certificate, and so you know. It is self-paced kind of thing that you do with most of them [edX, Coursera], more for professional reasons.

These views here are supported by other accounts of FutureLearn users, as outlined in **Section 6.3.1**, who take MOOCs on FutureLearn out of curiosity or personal interest about a particular subject, with no explicit extrinsic motivator. However, what is of interest is participant19_FL's notion of Coursera having an *American* feel, and he goes on to associate *American* MOOCs with career-oriented goals, and similarly, participant8_FL mentioned edX as being a very *professional* platform. As outlined in **Section 6.5.1,** learners were able to differentiate and change their patterns of engagement with courses based on what they termed 'technical' courses and more casual courses. What is of interest is, in these cases, participants were associating *platforms* rather than individual courses with these labels.

With FutureLearn attempting to promote itself as a platform for skills and professional development, they might consider addressing these perceptions, and try and make their courses more appealing to Indian learners who may want to use their courses for career-oriented goals.

Meanwhile, participant13_FL felt the opposite and felt FutureLearn courses were of more immediate benefit for her. When asked if she had taken edX MOOCs, a platform she had knowledge about, she said:

> I didn't [take courses on edX] because somehow it didn't really suit me... and so I much preferred, you know, I'm in the Open University course on English, but the regional English language office in the US state department, they offered me an online course with the University of Maryland, and that was on ELC, but that's about it, I didn't like the edX courses offered.

Further participant13_FL goes on to highlight why she preferred FutureLearn over NPTEL:

> I have seen some of their [NPTEL] courses. I felt of course that the one that I took [on FutureLearn] was far superior to the course offered on the NPTEL. It was presented immersively, it was much more attractive and done much better than what I've seen done in India

Contrary to the above two participants, participant13_FL felt, at least in her discipline of English language teaching, that the offerings on FutureLearn were better suited for her career than those offered on edX. This is also supported by the use of FutureLearn by teachers of English as outlined in **Section 6.3.4,** and it once again highlights the high regard that Indian learners have for FutureLearn courses when it comes to the Languages, and it could potentially be an area they could build upon to involve more learners from India. Moreover, this participant could differentiate between the platforms of FutureLearn and NPTEL, and recognize that at least in her domain (English Language), the limited offerings on NPTEL were of a lesser quality than the offerings on FutureLearn.

Studies have demonstrated the benefit of multiple short, succinct videos as being more engaging, and "Even high quality pre-recorded classroom lectures are not as engaging when chopped up for a MOOC" (Guo, Kim, & Rubin, 2014, p. 42). Most NPTEL videos,

however, are long-form classroom lectures, while some courses have chopped up the classroom lecture into smaller chunks. In some cases, participants that had experienced both NPTEL and Western MOOCs, could identify this apparent flaw in the design of NPTEL MOOCs:

> participant16_NPTEL: I think, their (Western platforms') audio-visual quality and the content is very much elite than this NPTEL. NPTEL has been recording through their orthodox professor teaching in their Indian engineering colleges, IIT's. This has been a new thing also for them. I think they have copied the same style that they used to follow in their classroom learning.

> participant6_FL: I find courses in NPTEL not that useful for what I am looking for because they are just recorded lectures or what the teachers do in class. So mostly they teach in a projector or talk in front of a mic, and, you know, just explain. So the things that people do in FutureLearn, they really give an animated view of it.

There has been considerable research on how to create effective educational videos for the MOOC format of learning (Brame, 2015; Kim, Guo, Cai, et al., 2014). However, as discussed in **Section 2.7.1**, NPTELs limited funding[26] possibly has necessitated the low-budget long classroom lecture videos, that has been shown in these studies to lower engagement and increase risk of students dropping out of the video (Kim, Guo, Seaton, et al., 2014). This is evident by the learners themselves identifying these issues as design flaws when comparing their experiences on NPTEL with those on Western MOOC platforms.

However, for participant27_NPTEL, it was, what he termed the *classroom experience* that attracted him to NPTEL's long-form video lectures.

> [I prefer] the longer ones because I like the classroom experience. I don't like these small videos. That's why I prefer NPTEL videos rather than edX. And because I think there is a difference between edX and NPTEL. NPTEL is more specific focused

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[26] A single FutureLearn course costs, on average, £30,000 (Parr, 2015) to produce, while the Indian Government allocated a budget of Rs. 600,000 (approx. £6500) per course for the repurposing of existing OER on NPTEL into the MOOC format (Sunder, 2015)

on kind of, like, for advanced people, like it's not for very beginners. On the other hand, edX is sort of like for everyone actually. You don't need a very strong background in things for most of the edX courses.

Interestingly, while the participants from the FutureLearn sample mentioned at the beginning of this section found the edX courses too formal and technical compared, for this learner, courses on edX are not advanced enough for his liking. This learner is undoubtedly an outlier, as he already had a PhD in Physics, and the survey too suggested the opposite, that learners from the NPTEL sample were significantly more likely to find the courses too advanced (U=180856, z=-6.837, p<0.001), and the assessment too challenging (U=158819.5, z=-8.534, p<.001 two-tailed) and time-consuming (U=181061, z=-3.187, p=.001 two-tailed) than learners on the FutureLearn sample. While MOOC designers cannot expect learners to possess PhD-level domain knowledge when designing their courses, this experience of this learner with a PhD who is still searching for more knowledge through MOOCs once again highlights the diverse range of learners that take MOOCs, with very different backgrounds and expectations from these courses. The survey found 1.4% of NPTEL respondents (n=29) and 6.6% of FutureLearn respondents (n=24) as already being PhDs, so it does suggest there is a demographic of learners with the highest level of education taking MOOCs; whether there is a market big enough to cater to the needs of these advanced learners though, has yet to be seen, with most MOOCs aiming at beginner level knowledge, and most courses aiming at an undergraduate level of study.

To summarise, some participants were able to differentiate between FutureLearn and the American based MOOC platforms, and considered the latter to be more *professional*, while FutureLearn courses were more *casual* and for their personal enrichment. This comparison at the level of platforms being professional and casual could be concerning for FutureLearn, which sees itself as a platform to help develop professional skills. At the same time, one interviewed participant felt that FutureLearn better met her needs as an English teacher, and highlighted once again the apparent advantage of FutureLearn in the Languages discipline in India. The few interviewed participants that had taken MOOCs on both FutureLearn and NPTEL were able to identify the apparent quality issues with courses on NPTEL, but nevertheless seemed sympathetic towards NPTEL, and recognised their

limited funding as being a primary reason for the difference in quality between the platforms. Lastly, while the survey responses suggested NPTEL learners found MOOCs to be more advanced, and the assessment too challenging and time-consuming, for one NPTEL respondent who had PhD level knowledge of the domain, even the courses on NPTEL were too easy for his liking. While this further demonstrated the diversity of demographics in MOOCs, it highlighted the pressures that MOOC designers have to go through, to attempt to cater to these different audiences, with different levels of prior knowledge and expectations of the MOOC.

6.5.6 Value of MOOC Certification

Integral to the learner experience is the perceived value that learners believe they receive from MOOCs. Whether it be through the new knowledge acquired when taking a course, or through skills that are transferrable to their everyday lives, this section explores what the participants in the study felt they got out of their engagement with MOOCs, and whether there were any significant differences in the perceived value between the NPTEL and FutureLearn respondents.

Existing literature suggests that while employers may be generally supportive of MOOC certifications (Radford et al., 2014), for the most part, there is still substantial debate over the value of a MOOC certificate in the eyes of employers, and is certainly no substitute for an actual degree program (Webb, 2015). For many of this study's participants though, particularly on the NPTEL platform, the certificate obtained from officially completing the MOOC was a significant motivation, both to gain qualification for further study (U=212905, z= -6.705, p<.001 two-tailed), and to improve their employment prospects (U=229034, z=-5.032, p<.001 two-tailed), significantly more so than the FutureLearn sample, who saw MOOCs more as an avenue for personal development (U=325,726, z= 4.485, p<.001 two-tailed), and for leisure learning (U=321,997.5, z= 6.397, p< .001 two-tailed), compared to the NPTEL sample.

MOOC providers often highlight learners that have taken their courses and secured employment or further education as a result of their certification. Participant27_NPTEL too highlights some of the anecdotal accounts of people he knows that benefitted from MOOCs

I have heard so many real-life stories … people who actually got the certificates from the online courses, and they actually help people to get a job, so that's quite encouraging to take these courses online. I know a couple of people, like not in my personal life but they are from my institutes, and like I have read a couple of people's stories online also … So they say taking these online courses actually do help like they actually get a decent job also.

Here, the participant is relying on third-party accounts of MOOC success stories but hasn't himself noticed any benefits from having the certificates. In fact, out of the 30 participants interviewed, while most could identify benefits of the certificate obtained from MOOCs, none had evidenced any tangible benefits from having a MOOC certificate, both in their career or in their further educational endeavours.

For participant21_NPTEL, who has nearly finished his studies and is now looking at the prospective job markets, he feels that MOOCs should be integrated within industry where possible, as was recommended in an early report on the potential of MOOCs in India (FICCI, 2014), and make it easier for students on these courses to attain employment through them:

The MOOC offered by Google at Udacity - you could apply for a job at Google with that certificate. And NPTEL is funded by NASSCOM, so it should be able to provide similar incentives.

However, not everyone was convinced about the value of a certificate. participant29_NPTEL, for instance, felt that your college degree had a far more significant impact on one's CV:

The first thing which adds value is actually the degree from which college you have, the basic full-time degree. If I am a mechanical engineer from NIT, or from a particular IIT, you are expected to know a few things whether you come up with certification in them or not. So if I say, okay, I know big data even without a certificate. They [Employers] will agree because I come from an IIT. But if I show them an extra certificate from NPTEL, it will not add any further value for me. So maybe for a fresher[Fresh undergraduate student], it will be useful, but for

somebody already with industry experience and a full-time degree, this will count more than the certificate.

He goes on to describe his attempts at seeking to understand the value MOOCs have for employers:

> I discussed it with a few HR guys in my company. as well as a few big American corporations as well as a few of my [workplace] colleagues who are at good places in HR into various industries, and unfortunately I found that first, nobody is actually aware of them; very few people are aware of them. Secondly, they are aware of them as just another online course, which as per them don't add much value because it's just multiple choice questions, something which is considered that anybody can clear in India. Not much value found in terms of industry acceptance.

Similarly, participant25_NPTEL felt that while he would like to showcase his MOOC certificates, he doesn't see them as being strong enough to put on his CV:

> I will put [the certifications] on LinkedIn only. Simply participating in NPTEL has no value to add to me, so I put that in LinkedIn only. There is no need to add these to my resume and CV.

And participant3_FL:

> Most of these courses, even if I get a certificate for them, they would not be of great help in at in my CV.

While the value of the certificate was an important factor for many participants on NPTEL, for participant30_NPTEL, a comparatively older user of NPTEL MOOCs, the value gained from studying on NPTEL was more personal, not necessarily attached to any extrinsic reward:

> participant30_NPTEL: Personally I find more value in these courses, not the certification per se - but that I am able to get up and go into something new because it's been 13 years now since I graduated. The world has changed a lot in 13 years. It changes every year. So there was no Big Data 13 years ago. There was very little of machine learning 13 years ago. Certainly, these courses are helping me. I will say

stress management something which I was taught in my MBA is entirely different from what I found in the IIT Kharagpur course for on stress management. Sustainability didn't use to be such a big thing at that time, which it is right now. So yes, these courses are adding value to me personally to my learning, and to my performance.

While participant30_NPTEL certainly was an outlier in many regards, his views on the value of MOOCs are similar to those of FutureLearn's lifelong learners.

In summary, respondents from the NPTEL sample were significantly more likely to see the importance of gaining MOOC certifications, in order to gain qualifications for further study as well as to improve potential employment prospects, while learners from the FutureLearn sample, as discussed in **Section 6.3.1**, were considerably more likely to be taking MOOCs for personal development and leisure learning reasons. While none of the thirty participants interviewed could identify any tangible benefit they have got to their career or further studies as a consequence of a MOOC certificate, some learners were still optimistic about their potential in the future, with one learner citing anecdotal accounts from others around him that have gotten further in their careers as a direct consequence of MOOC certificates.

At the same time, contrary to the aforementioned quantitative findings from the survey, some learners, particularly from the NPTEL sample tended to be sceptical about the potential benefits of MOOC certification, with one respondent finding that some employers lacked knowledge of MOOCs and were more generally sceptical of online course certifications, even if it contained the supposed prestigious IIT tag along with it. Finally, the open, flexible nature of MOOCs is likely what attracts traditional MOOC learners far more so than the value of the certificate. As has been observed through this study, learners that are intrinsically motivated, or wish to take MOOCs for learning's sake, who tend to be more from the FutureLearn sample, are not that much more likely to benefit from or even desire a MOOC certificate as a primary motivator. However, for the emerging demographic of young, upwardly-mobile learners from across India that use NPTEL MOOCs, it could be inferred that the certification plays a critical role in motivating them to undertake MOOCs,

and on the whole, these learners seem optimistic about the value of the MOOC certificate, even though they may not yet see any real benefit from doing so.

6.5.7 Challenges Faced by Learners

While most participants surveyed and interviewed generally had positive experiences of the MOOCs they engaged with, both on FutureLearn as well as NPTEL, this study further explored whether there were any challenges that learners faced, or were likely to face when learning from an Indian context. As this study has identified so far, there are two diverse demographics that learn on FutureLearn and NPTEL, and the platforms themselves are on entirely opposite spectrums with regards to pedagogy, course design, social learning, assessment and support. Off the nine Likert-type items on challenges faced by learners, learners from NPTEL had a statistically significant chance of experiencing seven of the nine challenges. This section explores these challenges faced by learners in this study and what techniques they used to try and overcome some of them.

6.5.7.1 Technical

Findings from the survey indicated that learners from NPTEL were significantly more likely to face technical challenges than learners from FutureLearn. One of the main challenges that NPTEL learners faced more so than the FutureLearn sample was related to connectivity (U=186232, z=-5.539, p<.001 two-tailed), and access to a reliable source of high-speed internet. With most MOOC content being delivered in the form of high definition videos, learners had to devise strategies to access the course material, and this often meant making use of public Wi-Fi connections in libraries, at work, or, for some, even at airports:

> Participant7_NPTEL: No, I don't stream [videos] because my connection is too slow, usually if I'm at the airport – edX has a very good downloader, it's on GitHub. I download courses from there and then if the internet speed is too slow, I can download pdf and assignment at that time, but when I needed the streaming might not be there like. And there may not be connectivity, and also streaming leads to buffering and all that thing, so I just download this stuff, and then I watch it.

Participant29_NPTEL: Because of the slow internet at home, I download all these lectures like during the week during my office hours only because there is no issue in my office to get into to download them. So I just download them during the weeks' time and then go through them during the weekends.

Participant21_NPTEL: I download them because I take my laptop to my college and there is a high-speed network there, so I download it there and then watch them at home on Saturdays and Sundays

Participant14_FL: I found that the video was not clear because my internet connection was very slow, but the audio was very clear So I found it very helpful to me that I can hear actually what the instructor is saying, and has subtitles so I can read if I miss anything.

In one case, the technical limitations had a direct impact on a learners' ability to complete courses.

Participant27_NPTEL: The problem with me ... what I do personally is because of this lack of Internet connection, I don't get internet connection all the time. So what I do whenever I have an internet connection, I download all the course materials at once and learn it at my own pace. Because to take a course you need to take it regularly. But I don't have this regular Internet connection all the time. So what I do is once all the course materials are available, say maybe on YouTube video or some other platform, so I download all the videos, and I go through them at my own pace, so I do not register for the course. Sometimes, like some other point when I have an internet connection that's stable for a couple of days, I do register on edX or Coursera, but eventually, again the same issue arises, of internet connection like so I am unable to complete a single course in edX. So I have never completed a single course like for no certification or something like that.

In the case of participant27_NPTEL, due to technical connectivity issues, despite being aware of MOOCs and recognising the benefit that these courses can give him, this learner is unable to take a course as per the 'online-only' requirements of Western MOOC platforms. In comparison, the main assessment for an NPTEL MOOC is a proctored

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examination at a number of regional centres across India. While in a global context, going to a physical examination centre to get a MOOC certificate would be considered a hindrance and time-consuming activity, for this learner, and likely many more like him, the physical centre examination is the only way they could potentially gain credit for the learning that they do on these platforms.

6.5.7.2 Language

Language was an important area of focus for the current study, as English, while the primary language of professional employment and higher education in India, is only spoken by around 12% of Indian society. Some interviewed participants highlighted that they needed subtitles, or had to use transcripts, in order to fully grasp what the educator was communicating - a finding supported by the survey results, with no significant difference observed between learners on FutureLearn and NPTEL respectively. Other respondents, primarily from NPTEL, had to slow down videos, or rewind and repeat, in order to comprehend the material, supporting the findings from the survey which showed that learners from the NPTEL sample were significantly more likely to find the option of slowing down and speeding up videos more vital to them than do participants from the FutureLearn sample ($U=237390.5$, $z= -2.347$, $p= .019$ two-tailed). It is also worth noting that despite these challenges, 29 of the 30 interviews were conducted in English, and only participant28_NPTEL requested that the interview be conducted in Hindi (all interviewed participants were given the option to be interviewed in either English or Hindi). Despite this, it was evident through some of the interviews with NPTEL learners that conversing in English was challenging, which, in some cases, may have led to shorter, and less detailed responses.

Interesting, though, of the two platforms, learners on NPTEL were statistically more likely to face challenges in understanding the accent of the instructor, compared to learners from FutureLearn ($U=172524$, $z= -7.205$, $p<.001$ two-tailed). While at first, this finding might be considered unexpected, this could be explained by the fact that Indian accents tend to vary considerably from region to region, and the more neutral English accent presented by most instructors on FutureLearn might be more familiar and easier to grasp to learners, with one

participant describing what he termed 'mental lag', related to his lack of English language expertise.

Therefore, with both FutureLearn and NPTEL MOOCs being predominantly in English, with NPTEL courses occasionally offering regional language subtitles on their videos, most MOOCs, in their current form, automatically exclude a significant majority of the country's population, who might struggle to keep up with the language of instruction.

It can be further argued that it is this majority that stands to benefit most from the free resources that MOOCs provide. These sentiments were echoed by participant12_FL, who, despite being a privileged and highly educated learner himself, could critically reflect that while MOOCs personally helped him with his own development, he was still sceptical about the broader impact these courses might have in India

> Participant12_FL: The people who already have basic knowledge of English, only they can get benefit by using MOOCs. Otherwise, for the beginner, who may not know anything about a subject area, to get into a course at the college level in English would be very difficult. So, personally, I think it[MOOCs] cannot have a great impact in India … but it does have some value, provided you have the knowledge of how to make use of these courses.

On the other hand, India does have a burgeoning aspirational class that wishes to improve their conditions in life, and MOOCs could potentially assist these learners, in providing them with the opportunity to learn in English, and in turn, improve their vocabulary, as well as their listening, reading and speaking skills. The survey found Languages (41.2%, n=150) and Education (32.7%, n=119) as the two most popular disciplines that participants from FutureLearn took MOOCs in (See **Section 5.1.1.8**), and through leveraging cultural institutions like the British Council, there was a clear recognition amongst participants that FutureLearn MOOCs were quality resources for the study of the English language. For participant14_FL, a 29-year-old schoolteacher from the state of Bihar, one of the more rural states in India, MOOCs were a flexible form of professional development, particularly in improving his English

My main motivation [in taking MOOCs] was to learn English for my betterment, and also to improve my teaching skills because I can't afford to go to big universities. This [FutureLearn] is the biggest platform for me to learn there without any cost, and it suits according to my profession also. I don't have to go to attend the classes because I am too busy taking my classes in school. So according to my timing, it suits me and helps me improve my English.

Whether or not MOOCs should be delivered in regional languages is a contested issue. Unlike nations with a uniform national language spoken by a majority of the population, India is unusual in that there are multiple regional languages spoken across the country, with no one language holding a significant majority. In this case, it would seem unfeasible for MOOC providers, particularly global providers, to cater to the various dialects from across the country. Nonetheless, a few courses on Indian MOOC providers NPTEL as well as SWAYAM do offer subtitles for their videos in regional languages, often crowdsourced from existing or previous cohorts, but no universal transcription or subtitles exist across the platform. However, since English is the primary language of business as well as higher education due to India's colonial past, there could be a benefit in having learners improve on their English skills through the courses, even if it comes at the cost of the inconvenience of subtitles, or a struggle to understand the accents of the educators.

6.5.7.3 Proctored Examinations

While proctored examinations were one of the low-tech solutions NPTEL offered to assist learners who may not have the ability or access to an internet connection, for many learners, the requirement to physically attend an examination for an online course was a significant factor impacting their ability to complete the MOOC and get the certification. For NPTEL, hosting examinations across the length and breadth of the country at various partner institutions has multiple purposes. First, and most importantly, it allows for quality control and does away with much of the potential scope for cheating and multiple-account strategies that is prevalent in many of the global MOOC platforms (Northcutt et al., 2016). The need for quality control is doubly essential due to the formal credit offered to learners on NPTEL and SWAYAM MOOCs (University Grants Commission, 2016). Second, the proctored examination gives the learner more confidence in the robustness of the

certificate, if they need to appear, in person, to an examination hall at one of India's leading institutions. For many such learners, who may come from more rural backgrounds, and might study at institutions of low repute, the opportunity to visit such institutions, and take examinations in their halls, was considered a moment of pride and honour.

However, for most learners, going to a physical location sometimes hours away, for an online course certificate is challenging, if not impractical. Learners already have had to manage their other commitments in order to make time for MOOCs, however with NPTEL providing certification only through in-person proctored examinations at regional IIT centres, leads to logistical challenges that deter learners from completing the courses, even though they may want to.

> Participant23_NPTEL: The timing was not suitable for me to go for that certification exam. It always happens around when my exams are happening in November or in February or in April. So I can't give it, and there is also a registration fee and all. And you have to go [in person] too. So I wasn't interested in that.

This timing clash of the proctored exam with the university examinations was a recurring theme, and participant25_NPTEL, participant7_NPTEL and participant11_NPTEL all shared a desire to receive the certification but could not due to their universities. Even though NPTEL is attempting to position itself as equivalent to students' university in importance and value, for most learners interviewed, their university degrees would almost always take precedence. Between forcing learners to physically show up to regional examination centres, as well as by aligning the proctored examinations of the MOOC with the broader exam-season in the country, NPTEL is potentially missing out on a lot of learners that might otherwise be inclined to take the exam[27]. NPTEL and SWAYAM could also potentially benefit from hybrid exams, where learners can choose to give the exam in person or online, based on their convenience. Yet, given the incredible budgetary constraints a public-funded not-for-profit enterprise like NPTEL, developing a robust

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[27] It is worth pointing out that this study was conducted prior to the formal MOOC credit framework being implemented. It is likely that the schedule of these MOOC examinations have been altered to fit around the formal exam period in India.

assessment system that can tackle some of the cheating concerns of online-administered testing may just not be an option in the foreseeable future.

6.5.7.4 Cost

When MOOCs were brought into the mainstream back in 2012, there was a promise of 'Openness' that was fundamental to the MOOC. Providers, both for-profit and not-for-profit, seemed first to be interested in the true open sharing of knowledge for everyone, around the world. As the years have passed, and as MOOC providers have had to develop business models to remain profitable or sustainable, the first thing to be eroded was the openness. From offering free 'honour code' certificates to all learners, and premium verified certificates to those willing to pay, MOOCs have slowly closed down more and more of their content, while providing free users with no real forms to demonstrate their knowledge gained through taking their courses (See **Section 2.2.2**). In any such system, the first to be impacted are the less fortunate, and those who cannot afford to spend between \$50-\$100 per course. While there was no statistically significant difference between NPTEL (M=4.2640, SD=1.0758, n=1538) and FutureLearn (M= 4.2053, SD=1.1606, n=341) respondents, both groups felt that 'Being able to study at no cost' was a very important factor in their experience with MOOCs (See **Appendix 15** for Histogram Comparisons). The survey also found that 22.5% of NPTEL respondents (n=453) and 14.6% of FutureLearn respondents (n=53) have paid for certification. It is worth noting that these figures likely represent certificate purchase figures amongst the more active core of learners and are likely not representative of the entire cohort of MOOC participants. Nevertheless, it shows that NPTEL respondents were considerably more likely to be purchasing a certification than the FutureLearn respondents, but that there is still much room for growth in converting learners, especially the more active and engaged ones, into purchasing a certificate.

As expected, the prohibitive cost of the MOOCs, particularly on FutureLearn, often deterred participants from applying for formal certification

> Participant2_FL: The price, I feel, was very high for me because I am from an average family: working, learning, and having a wife and children. If [FutureLearn]

reduce the cost, it will be nice that so many people may complete the course at least to have a certificate, but right now it is impossible.

Participant19_FL: If I do have the money, if it's very critical for my career, and if it's helpful, then I'd pay for it[a MOOC]. For example, I recently explored a very deep sort of set of courses or certifications or even an online degree in design, and I am willing to pay for it, just that I haven't found any which is sort of affordable.

With the Pound to Rupee conversion rate being close to 90 to 1 (As of 2019), it is no surprise that learners are struggling to pay the registration amount, which in some cases can be as high as £69. To put that price into a bit of perspective, the cost of an entire year's tuition for a Bachelor of Arts degree at the University of Mumbai, a premier public university of some repute is Rs. 3680 (approx. £40), extending to Rs 16940 (approx. £190) for a Bachelor's in IT[28]. While private universities certainly charge a lot more than those fees, and while there are learners that would be financially able to pay the cost of the FutureLearn certificate, those types of fees are incredibly prohibitive for the vast majority of learners from India, who likely stand to gain the most from any MOOC certificate. It is therefore not surprising that many of the FutureLearn participants interviewed, including ones that had completed over 9+ MOOCs on the platform, said they did not pay for any certificate due to financial reasons.

Most of NPTEL's courses are priced at a far more modest Rs. 1000, or just over £11. Most of these costs undoubtedly go into the facilitating and grading of the proctored examinations. By associating the modest cost with an actual physical event, it would seem learners would be more willing to pay for certification, however, even still, there were people struggling financially that could not do so:

Participant25_NPTEL: There is a fee of 1000 rupees for every course. Not everyone can pay that much amount. So my request to NPTEL would be to please reduce the

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[28] Fees sourced from http://mu.ac.in/portal/wp-content/uploads/2014/03/S.Y.T.Y.B.A.-B.Com-M.Com-M.A.-Prospectus1111.pdf Retrieved May 20, 2019

amount or may be put in a discount for ordinary people, maybe 500 or 600, price it like that one. 1000 is very high.

In contradiction to this, participant26_NPTEL, a 24-year-old man from Jammu and Kashmir, felt that NPTEL wasn't charging enough for its courses:

The completion certification that they are asking for 1000 rupees for a completion certificate and 1500 for a programming one, I think they should increase that. It should be at least 2000 rupees per certificate because 2000 is not that much for such quality education.

It is worth pointing out that after these interviews were conducted, an initiative by NPTEL (And SWAYAM) has attempted to further reduce the cost of fees as being a barrier to entry for learners, particularly for learners from economically underprivileged backgrounds. All learners can now apply for a 50% refund (Rs. 500) if they score over 40% on the proctored examination, and the enrolment costs for Scheduled Caste/Scheduled Tribes (SC/ST)[29] in India has been lowered to Rs 500, and those learners too can get a 50% refund (Rs. 250) upon scoring more than 40% on the proctored exam[30].

Similarly, as of late-March 2019, FutureLearn has introduced a yearly 'Unlimited' subscription model, where for $269 learners can sign up for and get certificates in as many of their 'online short courses' as they wished. Whether this price point is appropriate for Indian learners, or whether the Netflix-style all-you-can-learn format of MOOCs, as was piloted briefly by Coursera (Shah, 2017), is considered of value to most MOOC learners is to be seen. However, through changing their economic models, it seems both NPTEL and FutureLearn are taking steps to try and cater to learners who may not be able to afford the cost of certification.

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[29] Scheduled Castes (SC) and Scheduled Tribes (ST) are officially designated groups of historically disadvantaged people in India Source:
https://en.wikipedia.org/wiki/Scheduled_Castes_and_Scheduled_Tribes Retrieved 20 May, 2019
[30] Source: https://nptel.ac.in/LocalChapter/Assets/spoc_refdocs/Fee%20waiver-paymentdetails.pdf Retrieved 20 May, 2019

As MOOC providers have tried to develop their business models, individual courses have been bundled together to form, for example, 'Micro-Masters' on edX, 'Specializations' on Coursera, and 'In-depth Programs' on FutureLearn. Platforms have been promoting these bundles as being of much higher value than the individual course, and the cost associated with them often is significantly greater than the individual courses put together. More recently, MOOC platforms have arranged deals with partner institutions to provide complete Bachelor's or Master's level degrees, charging students in the tens of thousands of pounds. While these courses might be cheaper than their bricks and mortar versions, the apparent conversion of MOOC platforms from providers of free knowledge and certificates seem to be at odds with its current transition to commercial courseware and VLE providers (Reich & Ruipérez-Valiente, 2019). According to participant19_FL, a 34-year-old entrepreneur and start-up founder that has finished over 8 MOOCs, there is a big disconnect between the present business models of some of the MOOC providers and their initial promise of open education:

> It's hypocritical, you know. I mean we all know that the university system is a bunch of crap. That the whole thing runs on 'brand'. That learning is compromised - and that's the promise that platforms like FutureLearn and Coursera provide. The promise of learning for learning's sake. Where it can be accessible to anybody who knows that language and has internet access and some basic education - he could have used those tools. So that promise of learning is there. But - when they start going down the path of actually converting these courses into a degree, it starts getting close to the current university system. That is something that I am not fond of. Like why? Then what really is different about these MOOCs? Then it would just be like a bunch of courses provided, and if you want the certificate you pay $50-$100 or whatever, that's actually OK - cause even the platforms need to survive. There needs to be a business model, and that's fine, but when it goes towards the direction of a degree, then why suddenly the extra added cost? It should just be the sum of all the individual courses but together, why put such a premium price to it?

On the one hand, the provision of comparatively cheaper online Bachelor's and Master's programs has potentially given the opportunity to a whole new group of learners, not just

in India, but around the world, to get a formal degree from some of the world's leading institutions – learners who may have wished to do a degree abroad, but could not afford both the tuition as well as the costs associated with living in the institution's country. In fact, many of these online degrees offered on MOOC platforms explicitly state that the certificate will not indicate that they completed the degree online, rather than at a campus. However, in terms of the broader ideas of 'democratising education' and opening up knowledge for everyone, global MOOC platforms, including FutureLearn, seem to be taking steps away from openness, and moving towards becoming more traditional commercial online courseware providers.

6.5.7.5 Summary of Challenges

In summary, while some of the learners surveyed and interviewed faced challenges with their experience of MOOCs, learners from the NPTEL sample were statistically more likely to face the challenges than were learners from the FutureLearn sample. Access to reliable high-speed internet to allow for streaming of course video content was the primary concern of learners here, and many shared strategies of using their work or university's wifi connections to download course material for later study, highlighting a significant challenge implicit with a system of learning that heavily relies on streaming of high-quality video content. Having a stable enough connection to sit through the online assessment, in one case, prevented a learner from completing a course. It is unclear how common such occurrences are, but these challenges are likely only going to reduce with time, as more people get connected to the internet, and modern technology and infrastructure allow for more stable connections to spread across India.

Language too, was considered as a potential challenge that learners might face, but in contrast to what might be expected, learners from the NPTEL sample were the ones that had a significantly harder time with the accent of the instructor than did the FutureLearn sample, possibly due to the variety in English-speaking accents of Indians from different regions of the country, compared to the standard British English accent. As NPTEL conducts its assessment through proctored examinations, this too posed a challenge to many learners, who could not make the time to attend the examination or had the

examinations clash with their formal university studies, with the latter almost always taking precedence.

Lastly, the high cost to get certified on MOOCs, particularly on the FutureLearn platform, was a significant hindrance to learners, even the more active ones with over nine courses completed. While NPTEL, being a public funded not-for-profit enterprise has made it easier over time for learners with refund incentives and lowered fees for economically disadvantaged students, Western MOOC platforms have yet to create pricing structures that are affordable to Indian learners, and would make the proposition of paying for a MOOC certificate, which is a prime motivator for many learners, more economically feasible.

6.6 Answering Research Question 1(c)

This study found many similarities with existing research on MOOC learner experiences, and while the interviews revealed the nuanced differences in the authentic experiences between NPTEL and FutureLearn participants, there was considerable overlap in how the learners from India engaged with MOOCs. This section will answer the Research Question 1(c): *What, if any, are the differences in the experiences of Indian learners on an Indian MOOC platform (NPTEL), and a Western MOOC platform (FutureLearn)? And to what extent do these experiences differ from MOOC learners more generally, as identified in existing studies?*

The study found a relationship between the learners' patterns of engagement with MOOCs and their main intentions for taking the MOOC. Learners that took MOOCs more for leisure and lifelong learning, who tended to be from the FutureLearn sample, had flexible MOOC study schedules and were not as rigid as some of the learners interviewed from the NPTEL sample, who tended to be taking MOOCs for an extrinsic motivator such as career or educational development. These learners from NPTEL demonstrated high levels of Self-Directed-Learning and often had set times or days on which they engaged with MOOCs. Some of the learners interviewed, from both NPTEL and FutureLearn, seemed to confirm existing findings in the literature around Self-Directed-Learning and MOOCs (de Waard et al., 2015; Honeychurch et al., 2017; Loizzo et al., 2017), and were able to reflect on their own personal learning needs, and select parts of the MOOC that met their needs, and did

not necessarily refer to *completing the course* as defined by the MOOC provider. That being said, in the case of some NPTEL participants, MOOCs were being used at a comparatively superficial level, just to follow the syllabus and to assist them in passing their examinations. In this way, it could be argued that NPTEL is reinforcing the rote-based learning approach prevalent in Indian higher education (Singh, 2015), rather than using the affordances of online technologies to allow learners to gain a more holistic and critical understanding of the subject.

Further, this study was inconclusive in determining any similarity or difference between existing classifications of learners in MOOCs as outlined in **Section 3.3**, for example, those of 'No-Shows, Lurkers, Passive Participants and Active Participants' (Clow, 2013; Hill, 2013; Honeychurch et al., 2017; Kizilcec et al., 2013; Milligan et al., 2013) and the surveyed and interviewed participants. This is, in part, due to the lack of access of raw learner data from the platforms, as well as the methods of participant recruitment in both cases, leading to a self-selecting sample of active learners. This is evidenced by a self-reported completion rate (of at least one MOOC) of 45.1% from the NPTEL sample and 76.1% from the FutureLearn sample, well beyond the average completion rates observed in MOOCs as being less than 10% (Jordan, 2014). In many cases, learners reported completing multiple MOOCs, and many of the participants that agreed to participate in follow-up interviews had completed over nine MOOCs, and so were likely not representative of the broader MOOC cohort. That being said, insight into the experiences of these active, motivated learners did shed some light on the factors that lead to success in MOOCs, particularly in the Indian context.

With regards to the social elements of learning in a MOOC, surprisingly, the survey found no significant difference between the NPTEL and FutureLearn survey sample in their feelings towards interactions with other learners, but when interviewed, stark differences between the two groups emerged. Interviewed NPTEL learners seemed to be less motivated to engage in online discussions, with one interviewed participant openly hostile to the notion of discussing the topic online, suggesting that answering someone else's queries about a subject might give them an advantage over himself for the examination. It is unclear how commonly such a view is shared, but it's symptomatic of the broader issues around competitiveness in Indian higher education.

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That being said, as NPTEL is deeply embedded within the formal education system in India, some learners studying at the same institution formed into their own small study groups, using each other as sounding boards and flipping the MOOC experience for themselves. Participants from FutureLearn and NPTEL shared how they created social groups around MOOCs outside of the MOOC platform, on WhatsApp and Facebook, to keep the conversations going and maintain connections with learners beyond the strict timeline of a MOOC. While these endeavours were not always successful, they supported current findings from the literature (Veletsianos et al., 2015) that showed how learners don't just limit their MOOC learning experiences to within the confines of the MOOC platform.

FutureLearn participants interviewed, on the other hand, seemed to be more excited at the prospects of interacting and learning from participants around the world, engaging in critical debate and being exposed to ideas that compete with those prevalent in Indian society. These learners brought into question the notions of MOOCs as vehicles of neo-colonialism (Altbach, 2014; Wahyudi & Malik, 2014) where learners from the Global South are merely passive consumers of Western forms of knowledge. Some demonstrated an ability to critically reflect and recognise the competing world views shared on these platforms and actually felt this was a redeeming factor of global MOOCs versus MOOCs limited to an Indian audience. These learners, however, tended to be highly educated, from urban backgrounds and were not representative of the broader Indian population, who might not be able to think as critically on some of these issues.

While part of the difference between the social experiences of learners on NPTEL and FutureLearn could be explained by differences in disciplines, the MOOC platforms themselves are likely to contribute to such views. NPTEL, with its limited public funded budget, is unable to maintain more than a free Google Group where learners post doubts and try and get clarity on issues they may be struggling with, compared to the 'Conversation-framework' based approach on FutureLearn (Chua et al., 2017; Ferguson & Sharples, 2014) that encourages discussion at every possible avenue for learners, embedded within each 'Step' of the course. Hence, even though both NPTEL and FutureLearn survey respondents felt that interaction with other learners was a very important component of

their learning experience, the actual experiences of some of the most active learners, as outlined in the interviews, suggested that NPTEL learners might not value social interaction as much as learners on FutureLearn.

Next, the role of the instructor was repeatedly highlighted as an important factor in the experiences of learners on both NPTEL and FutureLearn, even though no significant difference was found between the two groups on the survey. Both groups were appreciative of the notion of 'learning from the best', and the idea of the 'star professor' teaching a MOOC came up quite often, particularly from some of the NPTEL participants interviewed, for whom, studying under some of the most renowned IIT professors was satisfaction enough, and were able to look beyond some of the glaring pedagogical and quality related shortcomings of the platform that a more discerning MOOC participant might not.

With that being said, both groups noted a lack of engagement from the professors on the MOOCs, finding it disappointing that they could not engage personally with the instructors on these courses. While it is unfeasible to expect professors to interact individually with thousands of learners on a MOOC, some have taken unique steps at bridging this gap, between leveraging social media (Bruff, 2013; Parr, 2013; S. Zheng et al., 2016) and in some cases having physical meetings with learners at specific locations around the world (Sanzgiri, 2013). These attempts were appreciated by some of those interviewed, but on the whole, these learners were left wanting more interaction with the instructor.

Next, learners described what they considered to be the differences in their experiences of learning on MOOCs, with their formal education that they have either done in the past or were currently in the process of completing. Some of the learners from the FutureLearn sample of interviewed participants, who tended to be older, found the MOOC learning experience considerably better than their own experiences with Indian higher education, and were quite grateful at the opportunity to study in such a high quality learning environment, another finding that was supported by the survey results, in which learners from the FutureLearn sample tended to give greater importance to the quality of the learning resources than those from the NPTEL sample. However, despite the apparent challenges with the quality of courseware associated with the publicly funded, low-budget NPTEL MOOCs, learners from the NPTEL sample that were interviewed still felt that those

MOOCs were a step-up from their universities, that many of whom were still currently enrolled in. While attempts are still ongoing all across India to further incorporate NPTEL, as well as SWAYAM MOOCs into the formal system through locally facilitated SPOCS, at the time of interviewing (December 2016-January 2017), learners were quite disappointed by the ways in which instructors at their universities were using NPTEL resources.

Some learners reported taking MOOCs on numerous MOOC platforms, and were able to compare their experiences on the two. Some learners differentiated *American* style MOOCs as being more *professional*, while FutureLearn was considered a more *casual* learning platform. At the same time, an English teacher felt that FutureLearn was far better at meeting her specific needs than edX or even NPTEL was, which once again highlighted the potential role of FutureLearn within the Languages. Some NPTEL respondents were able to recognise the general higher quality of Western MOOC providers over NPTEL, and recognise the problems with the long form lecture-hall based videos as being less engaging. At the same time, they acknowledged the lack of funding of NPTEL having a more significant role to play in it and were still appreciative of the content provided by the IITs.

While gaining certification was a very important motivator for many learners surveyed, with learners from the NPTEL sample being significantly more inclined to take MOOCs for certification than the FutureLearn sample, there were conflicting notions of the value such a certificate would practically hold in bettering their careers or educational opportunities. None of the participants interviewed mentioned any tangible benefit gained through gaining MOOC certification, and some were openly sceptical at the notion that employers would view MOOC certificates favourably in the Indian context, which is in contrast to studies from the West that found that while employers were still getting to grips with MOOCs, they were open to the possibility of using those certificates in their hiring processes (Egloffstein & Ifenthaler, 2017; Radford et al., 2014). As NPTEL and SWAYAM MOOCs have started to become embedded within the university framework across India, with universities able to allocate 20% of total credit of a degree through MOOCs (University Grants Commission, 2016) after the study was conducted, it is likely that attitudes of these learners towards the value of a MOOC certificate, particularly from NPTEL, would have changed, and is potentially an avenue for further study.

Lastly, this study explored some of the obstacles, or challenges learners might face that would negatively impact their experience of a MOOC. Unsurprisingly, NPTEL learners were significantly more likely to experience seven of the nine challenges outlined in the survey. First, technical challenges, such as the reliability of a stable internet connection, was a significant obstacle for many from the NPTEL sample, with some learners using their office or university Wi-Fi networks, which tended to be more reliable, to download all course material for later study offline. This ability to batch-download and later consume the content offline is in stark contrast to the often 'always-online' nature of MOOCs, especially in terms of assessment, which require learners to sometimes have a stable online connection for hours. At the same time, while NPTEL conducts proctored examinations at physical locations across the country, those too led to challenges for some learners interviewed, with some having to travel far to get to the centre, or with the MOOC examinations clashing with their formal study schedules. This challenge has likely also been addressed in part by the greater formalisation of NPTEL MOOCs within the education system.

Language was also a challenge for many learners on the NPTEL platform, who, in contrast to what might be expected, found the accent of instructors on NPTEL to be significantly more challenging than those from the FutureLearn sample, possibly due to the wide variety of accents of instructors from different regions of India. This was alleviated to a certain extent through subtitles in both English and both regional Indian languages, but with English remaining the primary language of instruction and employment in India and just over 10 per cent of the Indian population speaking English, this is likely to remain a sustained challenge for Indian learners.

And finally, the cost of the MOOC, especially the prohibitive cost of FutureLearn MOOCs, was likely causing a number of participants not to complete the MOOC. While NPTEL has taken considerable steps, offering discounts and refunds on successful completion of the MOOC, FutureLearn still has a long way to go in bringing its prices down for Indian learners, otherwise, it is likely only to be utilised by the wealthy, highly-educated learners that can afford the high cost of certification on FutureLearn, which, in some cases, even exceeds those of its global competitors like edX and Coursera. The recent move by

FutureLearn in late-March 2019, to create an annual subscription-based model is potentially a step in the right direction, but at a price of $269, is likely once again to be pricing out most learners from India that could stand to benefit the most from these resources.

Chapter 7: Discussion

This chapter holistically considers the analysis made in the previous chapter and discusses the role of MOOCs in India. While this study started as a comparison of platforms based on regions (Western and Indian), the more meaningful comparison that emerged was between a low-budget publicly funded platform for educational development in India and a privately funded, profit based Western MOOC platform, used largely by the privileged members of Indian society. This section considers this through the exploration of two main themes, the role of Indian MOOCs and the role of Western MOOCs in India. This chapter firstly outlines what the role of Indian MOOCs could be, and the inherent challenges associated with implementing MOOCs in India. Then, this chapter goes on to consider the role of the Western MOOC in India, through the lens of the neocolonialist conception of MOOCs as outlined in **Section 3.4**, as well as the potential role of Western MOOCs in professional and personal development of lifelong learners. This chapter lays the foundation upon which the Recommendations to the various stakeholders are made in **Chapter 8**.

7.1 The Role of Indian MOOCs

From the Indian Government's funding in developing and using MOOCs within the formal education system through NPTEL and SWAYAM, it seems certain that MOOCs will form an integral part of Indian higher education in the future. This study has shown how learners from smaller universities are making use of MOOCs to offset the low standards of teaching occurring at their institutions, and how many of these learners can get official certification from some of the top universities in the country. However, serious questions still remain about the quality of learning occurring using these platforms, whether technology is being appropriately utilised to support existing educators, or merely as an easy way to solve the supply and demand challenge facing Indian higher education without investing in developing high quality institutions and training world-class educators and academics.

Educational technology is currently gaining considerable popularity in India. Private firms are seeing immense potential in the Indian market and investing hundreds of millions into dozens of edtech startups (Burch & Miglani, 2018). While the focus of these investments

are mostly in K-12 education or test-preparation, the public perceptions of learning online have considerably changed in the past few years (ibid.). However, courses targeting higher education or lifelong learners have not yet had similar interest. This has largely been managed by the Indian Government, through the aforementioned platforms of SWAYAM and NPTEL. This has allowed for an easy transfer of credit from a semi-formal system like MOOCs to a formal credential at public universities (University Grants Commission, 2016), but at the same time has left much to be desired in terms of quality, variety, and appropriateness of the courses being offered. While private providers of post-secondary training exist, such as Upgrad for career development or Unacademy for general skills development, these ventures have had considerable funding to develop their platforms (Trehan, Sanzgiri, Li, Wang, & Joshi, 2017), and deliver world class courses on par with many Western providers. However, these courses lack the accreditation that NPTEL and SWAYAM have, and thus are likely to be limited in the broader impact they can have within the formal education space in India. The courses on these platforms also tend to be costly, targeting the working professional that can afford such fees, and have no free offerings. As such, these courses are closed to most learners that might get the most benefit from taking them.

Currently, there is a very specific demographic of learner that the Indian MOOC seem to be targeting, that is, the college going learner. There is considerable scope to increase offerings for lifelong learners, and for skills development for professionals, while keeping costs low. There is potential for public/private collaboration in this space, where the Government could provide accreditation for the programs, while the private enterprises provide the world-class platforms and content for the same. As discussed in **Section 2.4.1**, such a partnership has already been successfully implemented in a Global South context, with the Brazilian Government providing formally accredited MOOC degrees developed on the privately funded Veduca platform (Deucher, 2014; Machado de Campos et al., 2016). The most significant challenge facing Indian MOOCs are their low quality of content, assessment and instructor presence. These are problems that stem from a lack of funding, and a partnership with private platforms could considerably alleviate some of these challenges and make the Indian MOOC learning experience on par with international standards.

At the same time, there is a concern that moves to *MOOCify* Indian higher education are essentially technocentric in nature (Burch & Miglani, 2018), believing that technology will inherently solve the educational challenges of the 21st century (Selwyn, 2013), often at the cost of fundamental structural change or investment in the infrastructure and manpower needed to tackle the challenges of Indian higher education. The concern that MOOCs will make professors redundant has been echoed in the West (Kolowich, 2013; Schmidt, 2013), and as outlined in **Section 2.6.4**, there is already an ongoing effort to train educators across India in how to act as facilitators of MOOCs. On one hand, such efforts will allow more learners to have a considerably better learning experience than they currently receive at their universities, as the interviews with many NPTEL participants in this study demonstrated, however, such moves also risk the further commodification of education in India, with lecturers relegated to facilitating content from external universities, and not having much creative control over the learning process. Such a move is likely to be detrimental to Indian higher education in the long term, where instead of a plurality of perspectives, there is a singular centrally distributed curriculum for learners across India, without considering the diversity inherent in Indian culture.

Furthermore, if MOOCs, or any future technology, is seen as the only solution to the shortcomings of Indian higher education, rural and semi-urban communities are likely to be disproportionately affected, as resources are still needed on the ground at these locations to give learners the support they need. Studies have shown that the learners that are most likely to succeed in MOOCs are those who possess high levels of Self-Regulated Learning (Kizilcec et al., 2016; Littlejohn et al., 2016), along with the metacognitive tasks of understanding what their learning needs are, finding the appropriate resources, and the series of motivational strategies required to persist in MOOCs (de Barba et al., 2016; Eriksson, Adawi, & Stöhr, 2017; Halawa et al., 2014), as discussed in **Section 3.2** . Expecting learners from the lesser-developed parts of India to just pick up a device and learn through MOOCs, is likely not going to have much success in the long term, and is symptomatic of the neoliberal commodification of education.

In summary, Indian MOOCs have a clear role to play in Indian higher education, and are currently helping many learners from smaller universities and colleges get access to

resources and content that is significantly better than what they currently have. By global standards, Indian MOOCs still have a considerable way to improve their quality of content, platform, assessment and instruction, and due to the low-cost publicly funded nature of Indian MOOCs, it is likely going to require some form of public/private partnership to appropriately address these issues. At the same time, one must be cautious when implementing MOOCs more broadly across India, involving local stakeholders in the development and delivery of these courses, and not using MOOCs as a technocratic solution to the challenges of Indian higher education.

7.2 The Role of Western MOOCs in India

Western MOOCs have a number of potential roles to play in the Indian context, from professional development to lifelong learning, and this section will discuss these roles, and potential obstacles, in light of the current literature as well as the findings from this study.

Indian learners form one of the largest sub communities of learners on all of the major Western MOOC platforms (Christensen et al., 2013; Nair, 2013), and there is clear evidence that there is considerable interest in learning from Western providers. This study has demonstrated that, in the case of FutureLearn, many of the learners that take Western MOOCs tend to be middle to upper-class highly educated and privileged members of Indian society, and as discussed in **Section 6.5.2,** are often acutely aware of the implicit biases of a Western course and the influence of Western perspectives in the design, development and delivery of a MOOC. In fact, it is precisely the Western nature of the MOOC that attracted many learners to FutureLearn, as they wish to be exposed to differing ideas and gain a holistic global perspective on issues. In **Section 3.4**, the neo-colonial implications of Western MOOCs were outlined, which posits the naive populace of the Global South as passive consumers of Western hegemonic knowledge (Altbach, 2014; Czerniewicz et al., 2014; Wahyudi & Malik, 2014). However, the findings of this study suggest that view is perhaps simplistic and ignores the agency of the learners who are actively pursuing Western MOOCs such as those offered by FutureLearn, precisely because

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they are Western. While the desire to take Western MOOCs might stem from the inherent neo-colonial biases that give importance to Western knowledge over indigenous knowledge (Yeravdekar & Tiwari, 2014), it cannot be said with certainty whether these learners are actively deconstructing these power structures in their consumption of MOOCs. There may be elements of both, passive acceptance as well as active deconstruction of these neo-colonial biases, and future studies could focus on further unpacking these elements in the experiences of learners from Global South contexts such as India.

While the elite members of Indian society are benefiting from Western MOOCs, these participants make up a tiny fraction of the Indian population and are not the demographic of learners that are most likely to benefit from MOOCs. There are still considerable challenges to implementing Western MOOCs for educational development in India. In their 2016 Guide for Policy-Makers in the Developing World, the Commonwealth of Learning rightfully identified access to ICT resources and high-speed internet as one of the fundamental assumptions of the narrative of MOOCs for Development (Patru & Venkataraman, 2016, p. 35). Based on a 2017 report by the Internet and Mobile Association of India, while internet penetration is growing considerably in India, there is still an acute urban-rural divide in the rates of growth (The Economic Times, 2018), with roughly 20% internet penetration in rural areas, compared to around 65% in urban areas. These numbers don't consider internet speed – which is also crucial for streaming high definition videos on your devices. As this study showed through multiple accounts by NPTEL participants, there are clearly challenges when delivering courses through videos to these learners, who have to come up with innovative strategies to bypass these limitations and access the course material.

These findings suggest a concerning reality for those promoting MOOCs as a form of learning for Global South contexts: Learners most likely to benefit from access to resources like MOOCs, those from lesser developed parts of India, are also more likely to face accessibility and connectivity challenges. Conversely, learners from urban backgrounds, who are either already highly educated, or have access to some of the better educational institutions in the country, appear less affected by accessibility and connectivity issues.

This situation further highlights the disconnect between the idea of MOOCs as a form of democratisation of higher education, and the reality that MOOCs may be, in fact, further broadening the divide between those who have access to high-quality education and those who do not.

Another challenge for Western MOOC platforms is gauging what is a fair price for a MOOC, as each learner will likely have a multitude of factors to take into consideration: their own finances, the perceived value of the certificate, and the desire to make a financial commitment towards an online course, among others. What might seem expensive for one learner, may in fact be undervalued for another. The findings from both the survey and the interviews suggest that on average FutureLearn participants tend to be older, more educated, and more likely to be in full-time employment, and hence more likely to have a disposable income to spend on MOOCs. Nevertheless, they are considerably less likely to pay for a MOOC certificate than the NPTEL participant. While there may be many factors that might be attributed to this, the cost and financial accessibility of the MOOCs is undoubtedly one of the main ones. With a highly prohibitive cost per course, even in comparison to other global MOOC platforms like Coursera and edX, FutureLearn might have challenges in getting Indian learners to pay for a certificate at their current price point.

As more Indians transition to the middle to upper classes of society, the number of potential learners that would be interested in Western MOOCs for professional development is also likely to rise. With employers beginning to notice the potential of MOOC credentials (Calonge & Shah, 2016; Radford et al., 2014), and with the prestige usually associated with a Western education in India (British Council, 2014a; Yeravdekar & Tiwari, 2014), for Indians who cannot afford a foreign education, MOOCs could potentially be a comparatively affordable and convenient learning solution.

While MOOCs in India, including NPTEL and SWAYAM, have largely focused on the formal higher education sector as a supplement to higher education, not much investment has been made into MOOCs for lifelong learning. Where Indian MOOCs have failed, Western MOOCs, such as FutureLearn, as highlighted in this study, have shown to be

popular amongst a wide demographic of lifelong learners, from teens curious about particular subjects, to retirees using MOOCs to become informed about their medical conditions. Multiple participants in this study mentioned using Western MOOC certification in their LinkedIn or professional settings to help them find a better job or just to enhance their professional development, but fell short of suggesting the certificates in their current state had an active role in getting them a job or a promotion. Western providers could build partnerships with local employers in vocational training (Patru & Venkataraman, 2016), which help provide legitimacy and relevance to the local context, while also giving learners the tools for reskilling and ongoing professional and personal development (Farrow, 2018, p. 148). While the belief that a Western MOOCs will help learners in their career or personal development still privileges Western education, this is nevertheless another avenue for Western MOOCs to increase their presence in India.

In summary, this section discussed the role Western MOOCs currently play in India, as well as some potential roles it could play in the future. This study highlighted the multifaced nature of the Indian learner that studies on FutureLearn, and suggested a more nuanced interpretation of Western MOOCs as a vehicle of neocolonialism. It highlighted the class division that exists between learners that take Western and Indian MOOCs, and how despite Indian learners on FutureLearn being the more privileged members of Indian society, the cost of Western MOOCs still posed a considerable challenge for these learners. Finally, this section discussed how Western MOOCs could potentially play a role in the professional and personal development of lifelong learners in India, increasing their relevance and value through partnerships with local organisations.

Chapter 8: Conclusion

This chapter brings together the entire thesis, recapitulating the findings, while also discussing the broader contributions made by this thesis to our understanding of MOOCs.

Section 8.1 summarises the findings of all the three themes of this research study. **Section 8.2** outlines the contributions of this thesis. **Section 8.3** discusses some of the limitations of this study. **Section 8.4** provides recommendations to various stakeholders based on the findings of this study. **Section 8.5** suggests potential avenues for future research.

8.1 Summary of Findings

This thesis posed the question: What are the differences in demographics, motivations and experiences of Indian learners on an Indian platform (NPTEL) and a Western platform (FutureLearn), and in what ways do these findings relate to our current understanding of MOOCs. Through the use of a sequential mixed methods study, data were gathered through a combination of surveys and semi-structured interviews. The following are some of the key findings for each of the three main themes of this study:

Demographics

- NPTEL participants tended to be predominantly male, younger, and more likely to be in formal studies than the FutureLearn sample, which had a balanced male to female ratio, and tended to be, on average, older and more likely to be in full-time employment.
- Compared to existing large-scale surveys of MOOC learner demographics, Indian learners, on both NPTEL and FutureLearn, tended to be younger and more likely to be in some form of formal education
- While learners on NPTEL tended to be mostly undergraduate students, findings of the Indian learners from the FutureLearn sample supported existing findings of learners in MOOCs, on average, as being already highly educated.

Motivations

- This study found significant differences in the motivations for which learners from NPTEL and FutureLearn sign up for MOOCs. While NPTEL respondents were more

likely to take MOOCs for extrinsic benefits, such as career or academic progression, FutureLearn respondents were more likely to take MOOCs for leisure or curiosity-based learning.

- Some respondents from both FutureLearn and NPTEL demonstrated Self-Directed-Learning strategies, as identified in the literature, in being able to identify specific content relevant to their immediate needs, and not defining their personal 'completion' through the standards of the MOOC platform.

- Many NPTEL respondents were motivated to take MOOCs as a supplement to their formal studies, as the courses were closely mapped to the Indian curriculum.

- Some of the FutureLearn respondents interviewed were English teachers, who were using FutureLearn MOOCs to both aid in their professional development, as well as to use the resources of the MOOC to enhance their own teaching practice with their students.

Experiences

- There was a strong relationship between the patterns of engagement of learners and their motivations for taking a MOOC. Learners taking MOOCs for extrinsic benefits were more likely to have set days or times with which they would engage with MOOCs, while the more casual learners tended to be more flexible with their MOOC activity. Further, respondents would distinguish MOOCs taken for leisure, and MOOCs that were more 'technical' in nature, and would adapt their MOOC learning behaviour based on the perceived level of importance of each course.

- Respondents from both platforms highly regarded interaction with other learners, yet the respondents from NPTEL tended to work around the constraints of the MOOC platform, forming groups on social media and in-person at their colleges, while learners from FutureLearn tended to be more excited at the prospects of engaging in critical discussions with learners from a global cohort within the FutureLearn platform.

- Respondents from both platforms emphasised the notion of the 'star professor' and 'prestigious institution', but more so in the case of NPTEL respondents. While they

desired more interaction with the instructors, they were at the same time happy with the opportunity to study under IIT faculty.

- There was almost unanimous agreement among respondents that the MOOC learning experience was far superior to their formal education in India, either past or present. FutureLearn respondents put a significantly greater emphasis on the 'quality' of the MOOC, while some respondents from NPTEL, despite acknowledging some of the pedagogical and design limitations of the platform, still felt that the MOOCs were a step up from their colleges.

- Many respondents were sceptical about the value of MOOC certification. While some felt it added little to no value to their CVs, others were more optimistic, sharing anecdotal accounts of friends that benefitted through MOOC certification. Of note, however, none of the thirty respondents interviewed mentioned any tangible benefit to their careers or academic progression specifically because of a MOOC certificate.

- NPTEL respondents were significantly more likely to face challenges with their experience of MOOCs. The main challenge faced was technical, with many NPTEL respondents lamenting on their poor internet connectivity, having to download the course material to their devices when they had access to a high-speed WiFi connection at the airport or at the library. Further, the requirement of NPTEL to have learners give exams at a physical location, occasionally caused challenges to learners who could not make the journey to their regional centre or had the examination clash with their college studies.

- FutureLearn participants interviewed lamented the high cost of certification, which, when converted into local currency, was well beyond their means, despite their desire to showcase their learning. While both FutureLearn and NPTEL have since taken steps at lowering the costs and making their courses more accessible, the cost of Western MOOCs are still likely out of reach for the learners that are in a position to benefit the most from them.

8.2 Contributions of this study

In addition to the main findings, as set out in **Section 8.1**, which provide useful contributions to the MOOC research literature about our knowledge of MOOCs and the experience of learners that take MOOCs, this section discusses some of the more general contributions that this study provided. As such, the findings of this study have relevance for learning designers, educators, educational institutions, funders and policymakers alike, and recommendations to these stakeholders follow in **Section 8.4**.

First, through the sequential mixed-methods approach, this study identified a method of conducting exploratory MOOC research, combining quantitative demographic data, participant perceptions through Likert-type items, and semi-structured qualitative interviews, to provide a holistic overview of MOOC learners, and their authentic individual journeys through MOOCs. With qualitative research on MOOCs being used in less than 20% of empirical studies (Zhu et al., 2017), and a general lack of research into the learner perspective (Veletsianos & Shepherdson, 2016), this study provides an alternative method of making sense of the rich and varied experiences of learners, taking a pragmatic approach, and utilising the advantages inherent in both qualitative and quantitative research.

Next, through a cross-platform study, this thesis moved away from the tendency of MOOC research being limited to singular case studies or single-platform quantitative analysis. The study found considerable differences in the demographics, motivations and experiences of learners between the two platforms studied, with several layers of nuance in between, and highlighted the usefulness such a platform-level comparison could provide in our broader understanding of MOOCs.

The study further highlighted how important research in a context like India is. With most MOOC research tending to focus on Western contexts, studying Western MOOCs (Veletsianos & Shepherdson, 2015) and using Western theoretical frameworks (Raffaghelli et al., 2015), this study provided insight into non-Western sociocultural factors that impact learners and their experiences with MOOCs, and provided alternative views of what learners in non-Western contexts might find valuable in education (Looker, 2018).

While MOOC platforms in the West are typically private enterprises funded by venture capital, in India, MOOCs have been developed primarily through publicly funded means. This comparison demonstrated the pros and cons of both models, with privately funded MOOCs being of significantly higher quality, but pricing out most of the Global South through its premium certification costs. Similarly, the publicly funded MOOC platform of NPTEL was bare-bones with limited resources, and by most MOOC design standards would be considered to be of poor quality, yet were offered at an incredibly low cost to learners, with further incentives and discounts for learners from marginalised communities. Such a comparison, while not unique to the Indian context, contributes to our understanding of the practical implications of these different economic models of MOOCs, and how they might impact the learner experience.

Lastly, in terms of a theoretical contribution, the analysis of learners on FutureLearn revealed that Indian MOOC learners that sign up to Western MOOCs are not just as highly educated as existing studies on the entire MOOC population of learners, but are in fact more educated, and more likely to be in full-time employment. This finding alone has significant implications for the notion of MOOCs as vehicles of social mobility (van de Oudeweetering & Agirdag, 2018), particularly for learners in the Global South. Although it was not possible to fully explore the nuanced dynamics of post-colonialism in this study, it has sobered the perspectives of Western MOOCs being 'democratisers of education', as was promised in 2012, and brings into question whether Western MOOCs are an appropriate tool for development, as defined by the UN's Sustainable Development Goal 4[31] . With Indian learners being able to discern and actively seek out Western perspectives and ideas, this study brings into question the notion of Western MOOCs as a form of neo-colonialism (Adam, 2019; Altbach, 2014), and has brought to the fore the stark reality that in India, FutureLearn MOOCs are currently being used, for the most part, for leisure and lifelong learning, by the already privileged, highly educated members of Indian society. At

[31] SDG 4 aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (UNESCO, 2016)

the same time, this study showed how locally produced MOOCs, despite their limited budget and poor quality, are still helping improve the state of formal higher education in a Global South context. However, it also recognised that, in this case, NPTEL was reinforcing existing rote-based pedagogies endemic to Indian higher education and was not making full use of the potential affordances that technologies like MOOCs could offer to students.

8.3 Limitations of this study

As an exploratory study into a relatively new phenomenon, in a context that has yet to be studied in detail, there were some limitations to this research. First, recruitment of participants on the two platforms was not uniform, with one being a single email sent out by FutureLearn inviting learners to participate in the research, while the NPTEL recruitment was through a prominent call for participation on the front page of the MOOC platform, for an extended period of three months. This led to a considerably larger sample of NPTEL learners, and it could be possible that certain profiles of learners on FutureLearn might be missing from this study. Similarly, the lack of representation of female learners from NPTEL, as noted in **Section 4.3.3.1**, was also a limitation of this study, as all efforts to recruit female respondents were unsuccessful. As NPTEL already skews so heavily towards male learners, insight into the female NPTEL learner experience would have been a valuable addition to this study.

Any research that attempts to elicit responses from MOOC participants faces the inherent limitation of mostly attracting active learners, which, as is evident from the research, makes up a tiny minority of the actual participants in a MOOC (Breslow et al., 2013; Stanford University, 2013). In a study that elicited over 35,000 survey responses, only 4.3 percent represented learners who had enrolled but never returned to the platform to start the course (Christensen et al., 2013), while research suggests that in actuality that figure could be as high as fifty per cent (Breslow et al., 2013; Kizilcec et al., 2013).

Hence, as participants were recruited both through emails to learners that specifically opted in to be contacted about research on their experiences on FutureLearn, as well as through the platform website itself in the case of NPTEL, it is likely that the study attracted a self-selecting sample of active and highly motivated learners. That being said, this study's

aim wasn't necessarily to form a theory or draw conclusions that could be generalisable to the entire population of MOOC learners from India. As an exploratory study, the goal of this project was more to highlight the different, unique profiles of learners that take MOOCs on NPTEL and FutureLearn, and to triangulate findings from the survey and interviews to compare the demographics, motivations and experiences of learners on these two platforms. However, this research does acknowledge that the sample of learners in this study is likely overrepresented by active, highly motivated and successful MOOC learners, and is hence not representative of all learners from India.

Further, the Western MOOC platform that this study considered was FutureLearn, which has a comparatively smaller number of Indian participants than the larger Western MOOC providers of edX and Coursera. Hence, it is possible that certain profiles of Indian learners that choose Western MOOCs are missing from this study. Similarly, while NPTEL was the most popular MOOC platform in India at the time this study was conducted, the SWAYAM platform, launched in late 2016 has since become the largest MOOC platform in India, offering courses in a variety of disciplines, with NPTEL being just one of nine national coordinators on the SWAYAM platform. As NPTEL has a STEM-focus, this is likely to have had a bearing on the sorts of learners this study encountered, with the profiles of learners that would take Indian MOOCs in non-STEM disciplines missing.

There are also broader demographic issues to consider when looking at learners from India, particularly from a development perspective. There is currently little to no research that looks specifically at the demographics of MOOC learners from India, particularly at the platform level. However, due to the present barriers to entry of MOOCs, namely, a high speed internet connection, fluency in English, as well as the curiosity to be informed about MOOC offerings (Hollands & Tirthali, 2014), there could be the possibility that this study is overrepresented by Indian MOOC learners from mostly urban or semi-urban, educated backgrounds. Therefore, when attempting to assess the role MOOCs can have in the broader development framework of higher education and lifelong learning in India, especially with regards to improving access to education, this distinction must be made explicit, that the learners and the experiences represented in this study, are not necessarily the sorts of learners that might be best suited to benefit from a barrier-free, low/no-cost

quality learning experience. Hence, the title of this thesis questions the very notion of MOOCs for development. Nevertheless, this study informs us of the rich and authentic experiences of MOOC learners from India that are currently making use of these platforms, and still provides useful insight on some pertinent issues to learners in the Indian context, that could be applicable to the broader population of all potential learners from India.

8.4 Recommendations

This study not only adds to the knowledge of the nuanced experiences of MOOC learners from India. It also provides the basis for practical recommendations intended to be of relevance and utility to the varied stakeholders involved with MOOCs in India. The following section outlines a set of recommendations to three main stakeholder groups: MOOC platforms, MOOC instructors, and policymakers. The recommendations have emerged from the findings of this study, and each is explicitly linked to a specific section of the discussion from which it has emerged.

8.4.1 Recommendations to MOOC platforms

- Consider delivering course content through a variety of mediums, making it convenient for learners who may not have stable and secure internet access (**Section 6.5.6.1**). Streaming video still remains the primary medium of instruction on MOOCs, but learners across India have expressed challenges in getting access to these resources due to poor connectivity.

- Consider methods of getting more female representation on their courses (**Section 6.1.1**), as Indian learners on MOOCs, both Western and Indian, tend to be generally skewed towards males.

- Many learners from India tend to be in some form of formal studies (**Section 6.1.3**) considerably more so than the global average. Many of these learners tend to value certification and wish to study courses that may be more directly relevant to their formal studies, as many learners from India tend to use MOOCs as resources to supplement their formal education (**Section 6.3.3**). Attempts should be made, where possible, to situate the learning with the local context, allowing the courses

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to be made more directly relevant to these learners' needs, while at the same time acknowledging the global perspective in which the courses are designed.

- FutureLearn, and Western MOOC providers more generally, must reconsider the pricing of their certifications, as the cost is too prohibitive for most Indian learners (**Section 6.7.7.4**). While many participants showed an eagerness to get certificates through MOOCs, the cost was well out of their budget.

- NPTEL should consider providing flexible alternatives to their in-person proctored examinations (**Section 6.7.7.3**). While these examinations do provide credibility to the certification, they are often impractical for learners to attend, and often coincide with learners' college schedules. Western MOOC providers such as Coursera and edX have developed anti-cheating solutions to their online examinations, including face recognition and keystroke pattern recognition. While not perfect, such a solution could be adapted for Indian learners, allowing a significantly greater number of learners to take the examination and gain the certificate, while considerably lowering the costs of conducting examinations at the regional examination centres across the country.

- NPTEL courses can benefit from more social interaction and integrating more discussion into the assessment activities on the MOOC (**Section 6.5.2**). While some learners may not desire any interaction within the course, evidence from Western MOOC platforms suggests that learners that critically engage in discussion with other learners, over and above passive video consumption, are far more likely to persist and succeed with their course. At present, the NPTEL platform is considerably lacking in the social interaction department, and steps should be taken to engage the learners further.

- NPTEL videos could be edited down into smaller bite-sized components rather than hour-long lectures, as evidence from Western MOOCs has suggested shorter videos have significantly greater retention and engagement than longer, free-form video lectures (**Section 6.5.5**)

- The NPTEL mobile application needs significant improvements to be a useful learning tool (**Section 6.5.6.1**). The application currently functions as a drop-down list of downloadable course material, rather than being a self-contained learning environment that incorporates assessment, discussion, and content, such as the apps for FutureLearn, Coursera, or edX. Furthermore, learners have taken issue with being served pop-up advertisements on a Government funded educational mobile app.

- FutureLearn could develop more courses in STEM subjects, as many Indian MOOC learners tend to gravitate towards these courses and try to address the perceptions of some learners that FutureLearn is a *casual* learning platform, compared to other Western providers (**Section 6.5.5**).

- FutureLearn could further leverage its niche within the Language Learning segment in India (**Section 6.3.2**), by developing further courses that target Indian students going abroad for further study. As the British Council IELTS course has demonstrated, there is significant demand, especially in developing countries like India, for high-quality Language learning resources, that are practical and easy to follow.

- Specific guidance could be given to teachers that are incorporating resources from MOOCs into their classrooms (**Section 6.3.4**). However, unlike NPTEL content that is on an open Creative Commons license, FutureLearn's copyright restrictions should be loosened to allow for usage by teachers without any risk of copyright infringement.

- NPTEL should consider creating MOOCs that appeal more to the lifelong learner (**Section 6.3.1**), which might help them attract learners from more diverse demographic backgrounds.

8.4.2 Recommendations to MOOC instructors

- MOOC instructors should be aware of the importance given to them by learners from India (**Section 6.5.3**). Instructors should consider using this to their

advantage and leveraging their presence on the course using social media or other interactive platforms to engage the learners on a more personal level.

- MOOC instructors, particularly on NPTEL, should be aware of the role their accent plays in the comprehension of learners (**Section 6.5.7.2**). Attempts should be made to speak in a neutral English accent, and subtitles and transcripts should be provided for all video content.

- Provisions should be made for adequate non-instructor support to learners, through Teaching Assistants, or Mentors, as Indian learners, particularly on NPTEL, tend to prefer interaction with MOOC instructors or team members over fellow learners (**Section 6.5.3**). These TA's or Mentors can act as facilitators of guided discussion and could increase the overall social engagement of Indian learners.

8.4.3 Recommendations to Indian Policy Makers

- Develop a framework to evaluate the quality of MOOCs being delivered on SWAYAM and NPTEL, if they are to be incorporated into formal learning.

- Increase the funding for the development and delivery of courses, as currently, resources on Indian platforms are of much lower quality, and courses are poorly designed without learning from existing best practices in MOOC design from Western platforms.

- Fund courses from a diverse group of universities and colleges, and not focus most of the funding at the IITs and other top-tier universities.

- Increase investment in the training of teachers across the country, particularly from institutions with limited funding, and in rural/semi-rural settings, in order to help these teachers better facilitate the running of MOOCs through the flipped-classroom model, and ensuring teachers are making the most of the flipped model by engaging the learners through discussions during class, rather than repeating the course material.

- Collaborate with industry bodies, funding the development of MOOCs which deliver specific skills that are currently required by employers, and work to develop frameworks within which MOOC credentials are accepted, not just by public universities in India, but also by industry, allowing learners to use MOOCs to advance their careers outside of formal education.

8.5 Future Research

Several avenues of future research were identified during this exploratory study.

The demographic findings of this study, which in many cases supported existing research on global MOOC populations, once again put into question the narrative of MOOCs for development, to help people currently without access to higher education in the Global South. Studies could be conducted in other contexts in the Global South, an area of MOOC research that still is in its infancy, and could test whether MOOCs are used by mostly educated and employed learners who already have access to resources, or whether in certain contexts within the Global South MOOCs are, in fact, playing a role in providing access to those who lack resources. Further, as highlighted in **Section 2.4.1**, MOOCs are being used in unique ways in South America, Africa, the Middle East, and China. While research in these areas does exist, these are usually in the local languages of the particular region and aren't well documented in Western literature. Much could be gained from understanding how educators around the world are adapting MOOCs to fit their specific context, and could provide guidance to English-language based MOOC platforms to better cater to non-English speaking audiences.

Within the Indian context, there is a need to investigate the Indian government framework of allowing learners to transfer 20% credit from SWAYAM MOOCs towards their formal degrees. To what extent have universities made use of this framework; how many students have successfully completed a degree with partial MOOC credit; what are the administrator, lecturer and student perspectives on this initiative. These are all avenues for further research that might be useful, not just to stakeholders in India, but to other countries as well, who may be keenly observing how this formal recognition of MOOC credentials by the Indian government is being utilised, before considering implementing similar frameworks for MOOC credentialing in their respective countries.

While MOOC credentials seem to be getting formal recognition within Indian higher education, Indian employer perceptions of MOOC certificates is an area of research that needs to be investigated. Several participants mentioned taking MOOCs for professional development and career progression purposes, yet could only point to anecdotal accounts of success, and had not yet personally benefited through MOOCs in their careers. With the pivot of MOOCs towards workplace learning and skills development, it would be useful to identify to what extent do Indian employers value MOOC certificates, both Indian and Western, when hiring or measuring professional development, particularly in India where there is no shortage of graduate applicants. A survey instrument could potentially be used to investigate these employer perceptions across India, or in the Global South more generally. Unlike previous studies that tended to focus on IT related fields, which might already have an affinity towards alternate credentialing, the study could investigate these perceptions across various fields of formal employment. Further, long-term studies could follow learners after their completion of MOOCs, to find out what effect, if at all, has completing a MOOC had on their careers.

This study could not recruit any female participants from NPTEL for follow-up interviews. The perspective of the female Indian learner, particularly on a male-dominated platform like NPTEL, would be a valuable avenue for future research.

A further area of exploration could be the perceptions of learners on the benefit of social interaction in MOOCs across countries. While this study found no significant difference in how much Indian learners on NPTEL and FutureLearn valued social interaction in MOOCs, the interviews revealed quite polarising opinions. More broadly, comparisons were made between the affordances of global platforms like FutureLearn to engage with ideas and learners across the world compared to the limited emphasis provided to social interaction within Indian formal education. Platforms such as FutureLearn could investigate the discussion activity of learners, and try to identify if learners from India, or other Global South contexts, were more or less likely to engage in social activities, which could be followed up with an in-depth exploration of the off-platform social networks that learners create to discuss MOOCs in, and whether learners from the Global South tend to prefer these off-platform mediums over the discussion spaces within the MOOC. This could

provide useful insight into how culture might shape notions of social, discussion-based learning.

Lastly, the cross-platform analysis of learners proved to be reasonably useful at identifying distinct patterns of demographics, motivations and experiences between learners from the same context. Further studies could investigate learners across the different large Western MOOC platforms, or in other contexts in the Global South, to try and understand how learners perceive and make use of global and local MOOC platforms. This platform-level comparison would provide useful feedback to MOOC developers and learning designers alike, helping them make more informed decisions about how to deliver MOOCs to ensure a pleasant learning experience for most learners, while widening our understanding of the impact of MOOC design on learner experiences.

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Appendices

Appendix 1: Pilot Study Interview Schedule

What are some of the MOOCs you have taken? And what websites/platforms are you aware of?

Why did you choose to take these courses?

How do you normally learn from these courses?

What challenges have you faced while taking MOOCs?

What keeps you motivated to complete MOOCs?

For those that dropped out of a course they enrolled in: what made you drop out?

If you have taken both an Indian and Western MOOC, were there any differences in your experiences with both courses? If so, what were they? Good or bad?

What do you foresee as the benefits of MOOCs in India?

What do you foresee as the challenges MOOCs will face in India

Appendix 2: Pilot Study Participant Profiles

pilot1_Coursera was a 22 year old male, from the state of Kerala, had recently completed his undergraduate degree, and had signed up for a MOOC on programming on Coursera, along with a series of courses in Computer Science across the platform. He had paid for and completed 3 courses, and hoped these courses would help give him an advantage in his career.

pilot2_edX was a 34 year old male from Maharashtra with a postgraduate degree in electrical engineering. He had primarily used edX, and had completed 6 MOOCs on the platform on a variety of courses, from Computer Science to Chinese History, and was interested in these courses mainly out of personal interest and curiosity.

pilot3_edX was a 21 year old male from West Bengal with an undergraduate degree in computer science, who had completed 14 MOOCs at the time of interviewing, and had listed all of them on his LinkedIn profile, alongside his undergraduate degree. He was hoping to use his credentials from his course from IIM (Indian Institute of Management) Bangalore on edX, along with his other certificates to help secure him a place in their prestigious MBA programme.

pilot4_edX was an 18 year old male from Karnataka, who had just started his undergraduate degree in engineering from a government institute in Bengaluru. He had just started taking his first MOOC on edX on the recommendation of a friend at his college to help him with a similar course at his university, and was generally optimistic about the potential of online courses in India.

Appendix 3: FutureLearn Survey Invite Email

This was the email that was sent to Indian Learners on FutureLearn inviting them to participate in the study. Details about the study are not mentioned here, as the first page they would visit upon clicking the link to the survey would have all the information about the study **(See Appendix X)**

Subject: Your experience with FutureLearn

> Hello %n,
>
> As a learner from India, we would like to invite you to participate in a brief survey detailing your learning experiences with FutureLearn.
>
> Your responses will assist us in better understanding your unique needs and preferences, and in developing courses with your views in mind.
>
> The survey should take between five to seven minutes to complete, and as an incentive, five participants will be randomly selected to receive Rs. 2000 Amazon gift vouchers.
>
> Thanks!
>
> [Take Survey Button] <https://www.surveymonkey.com/r/FutureLearnIndiaSurvey>

Appendix 4: Survey Instrument

Introduction

You have been invited to complete this survey as part of a study on Indian learners' use of **free online learning resources**. This survey aims to identify the demographics, motivations and experiences of **Indian learners** who use these resources. The goal of this research is to outline what role these free online resources could play in **improving the state of higher education and increasing access to education in our country.**

I am a PhD researcher at the Open University, UK, and if you have any queries about my research or its results, you may contact me at janesh.sanzgiri@open.ac.uk, or my PhD supervisor at martin.weller@open.ac.uk.

This survey should take no more than **five to seven minutes** to complete, and you may stop answering the survey at any time by closing your browser. Your participation is greatly valued, and as a token of appreciation, **five participants who fully complete the survey will be randomly selected to receive a Rs. 2000 Amazon voucher.**

Any information you provide will be **stored securely and not released to any third party**. Research based on responses to this survey may be published openly. However all responses will be anonymised and it will not be possible to identify any individual from any published account of the results of this study. Our data protection policy complies with the Indian Information Technology Act (2000), and the UK Data Protection Act (1998).

This survey is using SurveyMonkey and any information you enter will be stored temporarily in the US. By taking part in the survey you are consenting to any information that can identify you as an individual being stored in this way.

Completion of the questions in the survey that follows indicates that you have read and understood the above information and in doing so, consent to be part of this research.

1. What is your gender?

☑ Male

◯ Female

◯ Transgender

◯ Other

2. What is your age?

[   ]

3. If you reside in India, which state do you currently reside in?

[▲▼]

4. If not in India, which country do you reside in?

[▲▼]

5. Are you a student?

◯ Yes

◯ No

6. If you are a student, please indicate the format of your studies 💬

○ Part time face-to-face

○ Full time face-to-face

○ Part time distance learning

○ Full time distance learning

7. What is your main employment status? 💬

○ Unemployed

○ Part-Time Employed

○ Full-Time Employed

○ Self-Employed

○ Student

○ Retired

8. What is the highest level of educational qualification that you have attained? 💬

○ None

○ Secondary School Certificate (Class X)

○ High School Certificate (Class XII)

○ College/Vocational Diploma

○ Undergraduate Degree

○ Post-Graduate Degree

○ PhD

9. In which language did you receive your highest level of educational qualification? 💬

[▲▼]

Other (please specify)

[   ]

10. From the following list of educational platforms, please select all the platforms you are aware of, as well as have used for learning

	Aware of	Have Used
iTunes U	☐	☐
Udemy	☐	☐
ApnaCourse	☐	☐
SWAYAM	☐	☐
OpenLearn	☐	☐
Futurelearn	☐	☐
ALISON	☐	☐
Khan Academy	☐	☐
iversity	☐	☐
Youtube	☐	☐
MIT OpenCourseWare	☐	☐
Ted Talks	☐	☐
P2Pu	☐	☐
IIT Bombay X	☐	☐
NPTEL	☐	☐
Wikipedia	☐	☐
Udacity	☐	☐
Coursera	☐	☐
Canvas	☐	☐
edX	☐	☐

Other (please specify)

11. In your estimation, how many free online courses have you signed up for? 💬

- ○ 0
- ○ 1
- ○ 2-4
- ○ 5-8
- ○ 9+

12. In your estimation, how many free online courses have you successfully completed?
[Completion is defined as finishing a majority of the course content or earning a certificate] 💬

- ○ 0
- ○ 1
- ○ 2-4
- ○ 5-8
- ○ 9

13. Have you paid for verified certification or any other form of premium service in an online learning resource? 💬

- ○ Yes
- ○ No

14. In which of the following subject areas have you used a free online learning resource?
[Tick all that apply]

☐ Physical Sciences (Physics/Chemistry)

☐ Medicine

☐ Social, Economic and Political Studies

☐ Business and Administrative Studies

☐ Education

☐ Mathematical Science

☐ Languages

☐ Creative Arts and Design

☐ Biological Sciences

☐ Engineering and Technology

☐ Humanities

☐ Law

☐ Computer Science

☐ Architecture

Other (please specify)

15. Approximately how many hours per week do you spend using free online learning resources?

○ 0-1

○ 1-3

○ 3-5

○ 5-8

○ 8+

16. Rate the following statements about your motivations for using a free online learning resource

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A
To gain confidence or self-esteem	○	○	○	○	○	○
For professional development	○	○	○	○	○	○
For personal development	○	○	○	○	○	○
As a replacement for college or university education	○	○	○	○	○	○
To improve employment prospects	○	○	○	○	○	○
For leisure or enjoyment	○	○	○	○	○	○
To assist my formal studies	○	○	○	○	○	○
To gain qualifications/credit for further study	○	○	○	○	○	○

Other (please specify)

17. How important are the following factors when you choose a free online learning resource?

	Not at all important	Slightly important	Moderately important	Important	Very important	N/A
Being able to improve my study skills	○	○	○	○	○	○
Videos being subtitled	○	○	○	○	○	○
Being able to access the materials at any time	○	○	○	○	○	○
Opportunities for my work to be assessed	○	○	○	○	○	○
Being able to slow and speed up video lectures	○	○	○	○	○	○
Receiving certification for completing the course	○	○	○	○	○	○
Being able to study the course online	○	○	○	○	○	○
Being able to try university-level content for free before signing up for a formal course	○	○	○	○	○	○
Opportunities for interaction with other learners	○	○	○	○	○	○
Being able to download course content to my personal device	○	○	○	○	○	○
Being able to study at no cost	○	○	○	○	○	○
The course platform being easy to use	○	○	○	○	○	○
The course being from a prestigious university	○	○	○	○	○	○
Transcripts being provided for videos and slides	○	○	○	○	○	○
Opportunities for interaction with the instructor	○	○	○	○	○	○
The course being of a high quality	○	○	○	○	○	○

Other (please specify)

[   ]

18. To what extent do you agree/disagree with the following statements with regards to challenges you have faced in your general experiences with free online learning resources? 💬

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
I have found discussion forums overwhelming	○	○	○	○	○	○
I have experienced video buffering	○	○	○	○	○	○
I have found the assessment too challenging	○	○	○	○	○	○
I have had insufficient contact with course instructors/tutors	○	○	○	○	○	○
I have experienced poor or unreliable internet connectivity	○	○	○	○	○	○
The level of the course has been too advanced	○	○	○	○	○	○
I have had difficulty understanding the accent of the instructor	○	○	○	○	○	○
I have found the assessment insufficient	○	○	○	○	○	○
I have found peer assessment too time consuming	○	○	○	○	○	○

Other (please specify)

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Thank you for participating in this survey. Your responses will provide valuable insight in understanding the role of Massive Open Online Courses (MOOCs) in Indian higher education. If you have any questions about this project, please feel free to contact the primary researcher at janesh.sanzgiri@open.ac.uk

As a token of my appreciation, if you would like to participate in a raffle for **one of five Rs. 2000 Amazon Online Gift Vouchers, please enter your email address below.** Your email address will be kept strictly confidential and not shared with anyone outside the research team.

Further, if you would like to be contacted for a **follow-up telephone interview** to discuss in greater depth your experiences with Massive Open Online Courses (MOOCs), please tick the appropriate box below. Selected interview participants will be entered into a **second raffle for five Rs. 2500 Amazon Online Gift Vouchers.**

19. Email Address: 🗨

[   ]

20. Please tick all of the following boxes as applicable 🗨

☐ I would like to participate in the raffle for the Amazon Gift Voucher

☐ I would like to participate in follow-up interviews

☐ I would like to be informed of the results of this study.

Please consider sharing this survey with your social networks, the more responses we get - the better our understanding will be of the impact MOOCs could have in our country Click the below buttons to share with the appropriate social network.

f SHARE 🐦 **TWEET** **Linked** in **8+ Share**

Or share a **direct link to the survey** @ http://www.tinyurl.com/SurveyShare

Appendix 5: Interview Recruitment Email

Hi,

I am writing this email to you as you had completed a survey some time back on your usage of NPTEL/FutureLearn and had indicated you would be interested in being contacted to discuss in further detail your experiences with NPTEL/FutureLearn.

I would like to invite you for a brief 20-30 minute conversation either via mobile phone (Or Skype). This conversation will discuss in greater detail your motivations to take these courses, your experiences completing these courses, as well as how these courses have helped you with your studies or career, if at all.

If you choose to participate **you will be shortlisted to receive one of five Rs. 2000 Amazon vouchers for your contribution to this study.** A final drawing of the vouchers will be taken on the 1st of February 2017, and you have a 1 in 6 chance of winning!

Please could you let me know a time-slot between 3PM and 9PM in **the next seven days**, in which I could call you, as well as **your preferred form of contact: Skype username or mobile phone number.**

If you have any questions about this, please feel free to contact me.

I look forward to hearing back from you soon to confirm a time for us to speak.

Thanking you

Janesh Sanzgiri

PhD Student - The Open University

Appendix 6: Brief Background of Interview Participants

participant1_FL was a man in his 50s from the state of West Bengal. He was in full-time employment, and was unaware of any MOOC platforms outside of FutureLearn. He had completed over 9 MOOCs on FutureLearn.

participant2_FL was a 31 year old man from Kerala, who was full-time employed with a postgraduate degree. He was enrolled in an MSc in Dementia Studies from the University of Stirling, Scotland, and had taken a corresponding MOOC on FutureLearn.

participant3_FL was a 20 year old man from Delhi and was a full-time undergraduate student. He was aware of all the major global MOOC platforms, and had completed over 9 MOOCs.

participant4_FL was a 56 year old man from Gujarat, who was self-employed and had only formally studied up to high school level. He had taken over 9 MOOCs from a range of disciplines, like Computer Science, Maths, Humanities and Education, and was doing these courses mainly for personal development.

participant5_NPTEL was a 21 year old man from Andhra Pradesh, and was enrolled in an undergraduate degree. He had completed over nine MOOCs on a variety of platforms both global and Indian, and was keen to use MOOCs for his employment and professional development.

participant6_FL was a 20 year old woman from Tamil Nadu, and was enrolled in an undergraduate degree. She had taken courses on FutureLearn and Coursera and edX, but was not aware of any Indian MOOC platform. She had started 2-4 courses but had only completed one. She was taking MOOCs mainly for personal development and to gain confidence.

participant7_NPTEL was an 18 year old man from Uttar Pradesh, currently completing his undergraduate studies in Bangalore. He had started 5-8 courses on NPTEL, but had

completed only 4, and had faced considerable technical problems, mainly with a stable internet, which had limited his ability to pursue MOOCs further.

participant8_FL was a 68 year old woman from Karnataka, who was retired with a PhD. She had completed between 5-8 courses on FutureLearn, and was taking courses in Business, Language, Humanities, Education and E-Learning, mainly to stay up to date and acquire knowledge and skills.

participant9_NPTEL was a 20 year old man from West Bengal, currently enroled in a full-time undergraduate degree. He had completed 2-4 MOOCs from NPTEL as well as edX and Coursera.

participant10_FL was a 54 year old man from Uttar Pradesh. He was in full-time employment in the forestry department of the local government, and had completed 1 MOOC to further his skills for his professional needs.

paricipant11_NPTEL was a 23 year old man from Andhra Pradesh who was unemployed with an undergraduate degree. He was spending 5-8 hours week on MOOC related activity, and was trying to use these certifications to assist him in his professional endeavours.

participant12_FL was a 26 year old man from Karnataka, who was enrolled in a part-time distance learning course, and was full-time employed. He had completed 1 MOOC from FutureLearn on Computer Science, primarily for his personal development.

participant13_FL was a 55 year old woman from Tamil Nadu who was full-time employed and had a PhD. Along with FutureLearn, she was also aware of NPTEL and Coursera, and had taken 2-4 courses in Languages and the Humanities, primarily for professional development and to keep abreast of the state of the art in her field.

participant14_FL was a 29 year old man from Bihar, who was full-time employed, and had a post-graduate degree. He was an English teacher in a government-run school and had completed between 5-8 MOOCs in the disciplines of Languages and Education, primarily to gain qualifications and confidence for his own professional practice.

participant15_FL was a 44 year old man from Delhi who was full-time employed and had an undergraduate degree. He was unaware of MOOC developments in India, but had

completed over 9 courses on FutureLearn and other global MOOC platforms. His primary motivation was mostly his professional development.

participant16_NPTEL was a 24 year old man from Haryana in the last term of his postgraduate degree. He was aware of global platforms along with NPTEL, and had completed over 9 MOOCs on the same. He was primarily taking these courses to build up a portfolio of certificates to improve his employment prospects.

participant17_FL was a 21 year old man from Tamil Nadu, who was a full-time undergraduate student. While he had signed up for over 9 courses, he had only completed one, and says he spends over 8 hours a week on MOOC related work.

participant18_FL was a 64 year old woman from Karnataka, who was retired with a postgraduate degree. A formal school headmistress, she had completed 2-4 MOOCs on FutureLearn to understand the latest advances in the Languages and Education disciplines.

participant19_FL was a 34 year old man from Maharashtra who was full-time employed and had a post-graduate degree. He was the founder of a startup, and had completed 5-8 MOOCs across various global MOOC platforms, to learn both about Computer Science and Business courses to help him with this startup.

participant20_FL was a 62 year old woman from Tamil Nadu, who had an undergraduate degree and was retired. She had completed over 9 courses across the many global MOOC platforms, primarily on Medicine and Bio-Sciences, to learn more about the conditions she and her husband faced medically.

participant21_NPTEL was an 18 year old man from Maharashtra, a full time undergraduate student. He had completed 2-4 MOOCs on NPTEL and spent over 8 hours a week on MOOC related activities, in Enginee ring and Computer Science.

participant22_NPTEL was a 19 year old man from Uttarakhand, a full time undergraduate student. Along with NPTEL, he was also aware of edX and had completed 2-4 MOOCs in total. He spends 1-3 hours a week on MOOC related activity, taking courses mostly in the Engineering and Technology disciplines.

participant23_NPTEL was a 21 year old man from Maharashtra, who was a full-time undergraduate student. He had completed one course on NPTEL in Computer Science.

Participant24_NPTEL was a 22 year old man from Rajasthan, a full-time undergraduate student. He was only aware of NPTEL from his university, and would spend 3-5 hours a week on MOOC related study.

Participant25_NPTEL was a 21 year old man from Andhra Pradesh, who was a full-time undergraduate student. He had completed one course on NPTEL primarily to aid in his formal studies, and to gain further qualifications through the MOOC certificate.

Participant26_NPTEL was a 24 year old man from Jammu and Kashmir, who was unemployed and had an undergraduate degree. He had taken course on multiple platforms, completing 2-4 courses in Computer Science. He was taking MOOCs to help him boost his qualifications for further study abroad.

Participant27_NPTEL was a 28 year old man, currently a PhD student from Orissa, who had completed 2-4 MOOCs from Physics, related to his coursework, to Philosophy, out of general interest.

Participant28_NPTEL was a 22 year old man from Uttar Pradesh, who had completed an undergraduate degree in Engineering, and was using MOOCs to help further his knowledge and prepare himself for postgraduate study in India. Of note, he was the only participant to request that the interview be conducted in Hindi rather than English.

Participant29_NPTEL was a 26 year old man from Gujarat, who had completed his postgraduate studies and had taken over 9 MOOCs from NPTEL, but had not completed any. His primary motivator was to gain knowledge to help him in his career.

Participant30_NPTEL was a 24 year old man from Maharashtra, who had taken 5-8 MOOCs from NPTEL as well as edX and Coursera, and was interested in learning for personal fulfilment reasons, and not for any particular certification.

Appendix 7: Interview Schedule

[Introduce researcher]

[Introduce Research Study and its Motivation. Explain the type of questions that will be asked and set a time limit to each interview (30 minutes).]

Background

Can you tell me a bit about yourself (Establish Rapport)?

Where and what are(have) you studying at university? Which university, if applicable.

If working, where and what are you working as?

MOOC Motivations (Hew and Cheung, 2014)

How did you find out about [course platform]? Have you heard of/used others?

Why did you choose to take a course on [course platform]?

[If completed a course] What motivated you throughout the course to get you to finish? [Probe for intrinsic and extrinsic factors]

[If not completed a course] What do you feel affected your ability to complete the course?

[If both completed and not completed course] What do you feel were the differences which led you to complete one course, but not complete another?

In what ways did you regulate[structure/plan] your learning when taking a course? (Hood, Littlejohn and Milligan 2015)

Attitude towards elements of a MOOC (Conole, 2013)(Liu, Kang and McKelroy, 2015)

What did you like the most about the course? Why?

What did you like the least about the course? Why?

How would you improve the experience of learners on the course?

Attitude towards MOOCs in general (Based off Pilot Interviews and Survey Findings)

How would you compare your experience of learning in this course with a face-to-face course?

In what way, if any, has taking these courses impacted your life? [Probe for education/work benefits - or self-improvement, based on response]

[If taken both Indian and Western MOOC] What differences have you found between the two courses, if any?

What do you foresee as the role these courses could play in India?

Appendix 8: Interview Themes and Codes

1: Background

- Aspiration
- CourseType
- DiscoveredMOOC
- DistanceEd
- EducationBackground
- Employment
- Family
- Hobby
- Location

2: FormalEdExperience

- DifferenceInEd
- IndianEd

3: ComparisonOfMOOCs

- CompareFLandWesternPlatforms
- CompareIndWest

4: Impact

- Appreciation
- Assessment
- Benefit
- Certification
- Rigour
- TransferableSkill
- Value
- MOOCOptimist

5: Engagement

- BingeLearning
- Flexibility
- LifeLongLearning
- PassiveLearning
- SocialLearning

- TimeManagement
- TimeSpent

6: Motivation

- Motivation/Intention
- ReasonDropOut

7: Instructor

- StarProfessor
- InstructorEngagement

8: Challenges

- Accent
- Downloading
- Technology
- Transcripts
- Language
- Cost

9: Feedback

- Outreach
- CourseDesign
- CourseLength
- Content

Appendix 9: Information Sheet and Informed Consent Form

CONTACT:
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MOOCs for Development? A Study of Indian Learners in Massive Open Online Courses

What is the aim of this research?
The purpose of this study is to generate a better understanding of the experiences and motivations of Indian learners who enrol in Massive Open Online Courses (MOOCs – Free Online Courses).

Who is conducting the research and who is it for?
The research is being conducted by Mr. Janesh Sanzgiri for his PhD thesis at the Open University, UK.

Why am I being invited to participate in this research?
You have been contacted through WhatsApp based on your activity on [MOOC].

If I take part in this research, what will be involved?
You will need to provide a contact number (Either landline or mobile – or Skype, if you prefer), through which you will be interviewed for a period of approximately twenty minutes.

What will we be talking about?
We will be discussing a bit about your background, how you found out about these courses, and about what you intend to do with the knowledge gained through these courses. We will also discuss the various aspects that influence your experience with these courses, including content, assessment, social features, and the design of the MOOC and the MOOC platform. We are interested in identifying which aspects of the course you liked, and which aspects of the course you would prefer to be changed.

Is it confidential?
Your participation will be treated in **strict confidence** in accordance with the UK Data Protection Act (1988) and the Indian Information Technology Act (2000). No personal information will be passed to anyone outside the research team. We will write a report of the findings from this study, but no individual will be identifiable in published results of the research. Interview recordings and transcripts will be securely stored by the primary researcher, and deleted at the completion of the study.

What if I do not wish to participate in this research?
If you would prefer not to be contacted about this research, please contact the primary researcher (Janesh Sanzgiri) using the contact information provided at the top of this page to let us know and we will not contact you again. Your participation is entirely voluntary. You may opt out of the study at any moment during the interview process. At the end of the interview, you will have 14 days to inform the primary researcher if you do not wish your responses to be included in the study.

What if I have other questions?
If you have any other questions about the study we would be very happy to answer them. Please contact the primary researcher (Janesh Sanzgiri) using the contact information at the top of this page.

I would like to be informed of the results of this study

Please indicate either during the interview or as a reply to this email if you would be interested in learning about the results of this study, and a report will be emailed to you after the completion of this study.

If you understand and agree to all of the above, please complete the below form and sign the same. If you do not have a digital signature, your full name will be adequate.

CONSENT FORM

Title of Project: **MOOCs for Development? A Study of Indian Learners in Massive Open Online Courses**

Name of Researcher: **Mr Janesh Sanzgiri**

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, up to fourteen days after taking part in the interview.

3. I understand that the information collected through the interview will be used to support other research in the future, and may be shared anonymously with other researchers.

4. I agree to take part in the above study.

Name of Participant	Date	Signature

Name of Person taking consent.	Date	Signature

Appendix 10 – Relation between MOOC completion and MOOC certification purchases

In your estimation, how many free online courses have you successfully completed? [Completion is defined as finishing a majority of the course content or earning a certificate] * Have you paid for verified certification or any other form of premium service in an online learning resource? Crosstabulation

Count

			Have you paid for verified certification or any other form of premium service in an online learning resource?		
			Yes	No	Total
NPTEL	In your estimation, how many free online courses have you successfully completed? [Completion is defined as finishing a majority of the course content or earning a certificate]	0	58	790	848
		1	172	233	405
		2-4	180	199	379
		5-8	23	46	69
		9	19	23	42
	Total		452	1291	1743
FutureLearn	In your estimation, how many free online courses have you successfully completed? [Completion is defined as finishing a majority of the course content or earning a certificate]	0	5	71	76
		1	16	74	90
		2-4	20	99	119
		5-8	7	22	29
		9	5	33	38
	Total		53	299	352

Appendix 11: Respondents by State

			NPTEL	FutureLearn	Total
	Andaman and Nicobar Islands	Count	2	0	2
		% within each Sample	.1%	0.0%	.1%
	Andhra Pradesh	Count	157	13	170
		% within each Sample	8.0%	3.7%	7.4%
	Arunachal Pradesh	Count	2	1	3
		% within each Sample	.1%	.3%	.1%
	Assam	Count	28	4	32
		% within each Sample	1.4%	1.1%	1.4%
	Bihar	Count	53	6	59
		% within each Sample	2.7%	1.7%	2.6%
	Chandigarh	Count	14	2	16
		% within each Sample	.7%	.6%	.7%
	Chhattisgarh	Count	28	1	29

			1.4%	.3%	1.3%
		% within each Sample			
	Dadra and Nagar Haveli	Count	1\\\\\\\\\\\\	0	1
		% within each Sample	.1%	0.0%	.0%
	Goa	Count	5	2	7
		% within each Sample	.3%	.6%	.3%
	Gujarat	Count	222	14	236
		% within each Sample	11.3%	4.0%	10.2%
	Haryana	Count	40	13	53
		% within each Sample	2.0%	3.7%	2.3%
	Himachal Pradesh	Count	9	1	10
		% within each Sample	.5%	.3%	.4%
	Jammu and Kashmir	Count	6	2	8
		% within each Sample	.3%	.6%	.3%
	Jharkhand	Count	21	3	24

		% within each Sample	1.1%	.9%	1.0%
	Karnataka	Count	100	48	148
		% within each Sample	5.1%	13.8%	6.4%
	Kerala	Count	61	17	78
		% within each Sample	3.1%	4.9%	3.4%
	Lakshadweep	Count	1	0	1
		% within each Sample	.1%	0.0%	.0%
	Madhya Pradesh	Count	63	3	66
		% within each Sample	3.2%	.9%	2.9%
	Maharashtra	Count	222	46	268
		% within each Sample	11.3%	13.2%	11.6%
	Meghalaya	Count	1	0	1
		% within each Sample	.1%	0.0%	.0%
		Count	66	28	94

	National Capital Territory Delhi	% within each Sample	3.4%	8.0%	4.1%
	Odisha	Count	37	4	41
		% within each Sample	1.9%	1.1%	1.8%
	Pudducherry	Count	44	5	49
		% within each Sample	2.2%	1.4%	2.1%
	Punjab	Count	40	9	49
		% within each Sample	2.0%	2.6%	2.1%
	Rajasthan	Count	51	7	58
		% within each Sample	2.6%	2.0%	2.5%
	Sikkim	Count	2	0	2
		% within each Sample	.1%	0.0%	.1%
	Tamil Nadu	Count	217	59	276
		% within each Sample	11.1%	16.9%	12.0%
	Telangana	Count	105	9	114

		% within each Sample	5.4%	2.6%	4.9%
	Tripura	Count	3	0	3
		% within each Sample	.2%	0.0%	.1%
	Uttar Pradesh	Count	215	18	233
		% within each Sample	11.0%	5.2%	10.1%
	Uttarakhand	Count	36	12	48
		% within each Sample	1.8%	3.4%	2.1%
	West Bengal	Count	106	22	128
		% within each Sample	5.4%	6.3%	5.5%
Total		Count	1958	349	2307

Appendix 12: Histogram Comparison of Motivation Likert-type items

NPTEL   FutureLearn

For professional development

51.47% 53.64%
34.54% 30.61%
8.28% 4.96%
1.60% 2.92%
2.58% 4.08%
1.53% 3.79%

Per cent   Per cent

NPTEL   FutureLearn

For personal development

52.14% 65.14%
35.47% 27.43%
7.33% 3.43%
1.53% 0.86%
2.63% 2.29%
0.92% 0.86%

Per cent   Per cent

NPTEL   FutureLearn

For leisure or enjoyment

NPTEL: 5.00 — 13.34%, 4.00 — 28.57%, 3.00 — 25.68%, 2.00 — 15.10%, 1.00 — 11.98%, .00 — 5.35%

FutureLearn: 5.00 — 23.72%, 4.00 — 36.64%, 3.00 — 18.62%, 2.00 — 12.01%, 1.00 — 6.31%, .00 — 2.70%

NPTEL   FutureLearn

As a replacement for college or university education

NPTEL: 5.00 — 21.40%, 4.00 — 23.82%, 3.00 — 25.37%, 2.00 — 17.18%, 1.00 — 8.62%, .00 — 3.60%

FutureLearn: 5.00 — 9.58%, 4.00 — 22.46%, 3.00 — 26.95%, 2.00 — 20.96%, 1.00 — 11.38%, .00 — 8.68%

357

NPTEL | FutureLearn

To assist my formal studies

NPTEL	FutureLearn
41.58% (5.00)	33.33% (5.00)
41.27% (4.00)	35.71% (4.00)
10.55% (3.00)	13.69% (3.00)
1.48% (2.00)	5.36% (2.00)
2.90% (1.00)	4.46% (1.00)
2.22% (.00)	7.44% (.00)

Per cent

NPTEL | FutureLearn

To gain confidence or self-esteem

NPTEL	FutureLearn
45.99% (5.00)	45.06% (5.00)
37.43% (4.00)	36.34% (4.00)
10.40% (3.00)	11.63% (3.00)
1.65% (2.00)	2.03% (2.00)
3.06% (1.00)	3.49% (1.00)
1.47% (.00)	1.45% (.00)

Per cent

358

Appendix 13 : Tests of Normality for Motivation Likert-type Items

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
To gain qualifications/credit for further study	NPTEL	.272	1520	.000	.768	1520	.000
	FutureLearn	.228	313	.000	.857	313	.000
To improve employment prospects	NPTEL	.267	1520	.000	.771	1520	.000
	FutureLearn	.247	313	.000	.832	313	.000
For professional development	NPTEL	.278	1520	0.000	.695	1520	.000
	FutureLearn	.293	313	.000	.671	313	.000
For personal development	NPTEL	.287	1520	0.000	.691	1520	.000
	FutureLearn	.369	313	.000	.584	313	.000
For leisure or enjoyment	NPTEL	.181	1520	.000	.918	1520	.000
	FutureLearn	.247	313	.000	.877	313	.000
To gain confidence or self-esteem	NPTEL	.266	1520	.000	.731	1520	.000
	FutureLearn	.264	313	.000	.747	313	.000
As a replacement for college or university education	NPTEL	.166	1520	.000	.915	1520	.000
	FutureLearn	.169	313	.000	.931	313	.000
To assist my formal studies	NPTEL	.288	1520	0.000	.733	1520	.000
	FutureLearn	.285	313	.000	.797	313	.000

a. Lilliefors Significance Correction

Appendix 14 – Mann-Whitney U-Test of Motivation Likert-type items

Note: 1 – NPTEL sample; 2- FutureLearn Sample
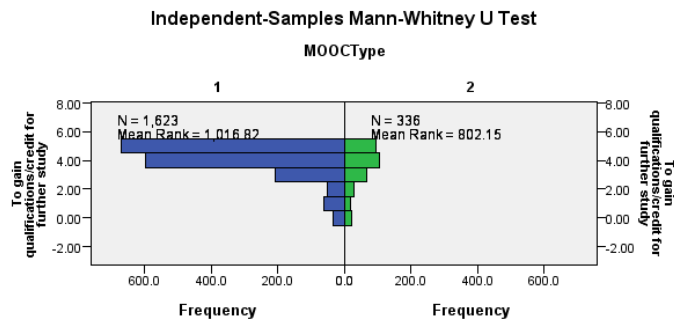
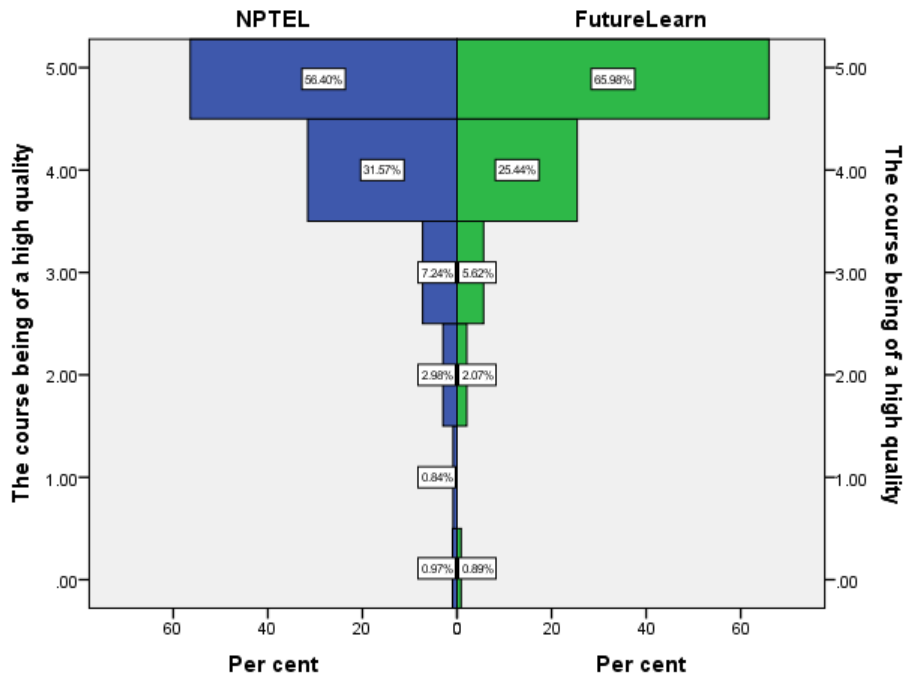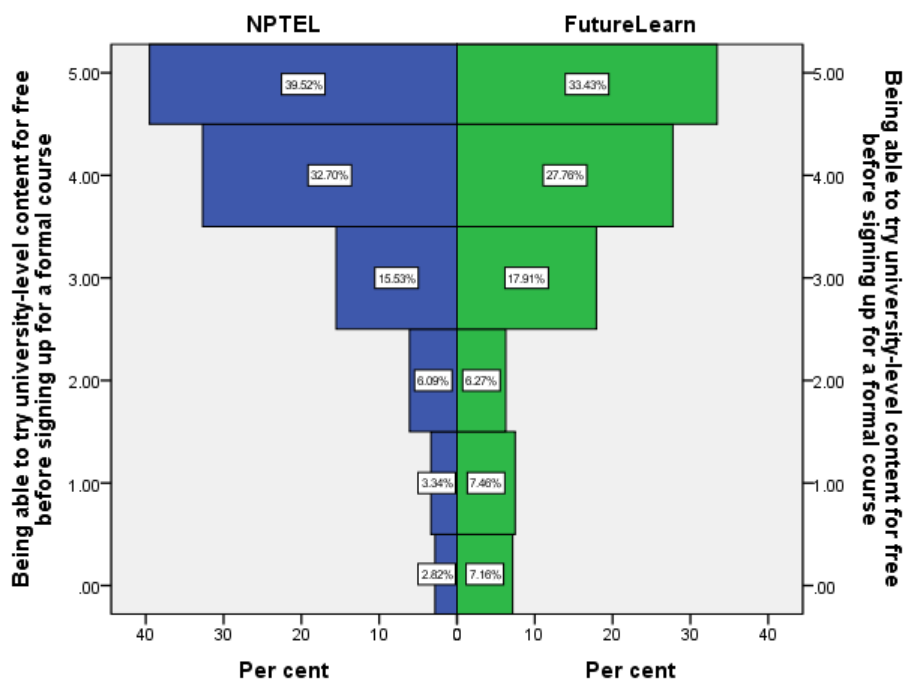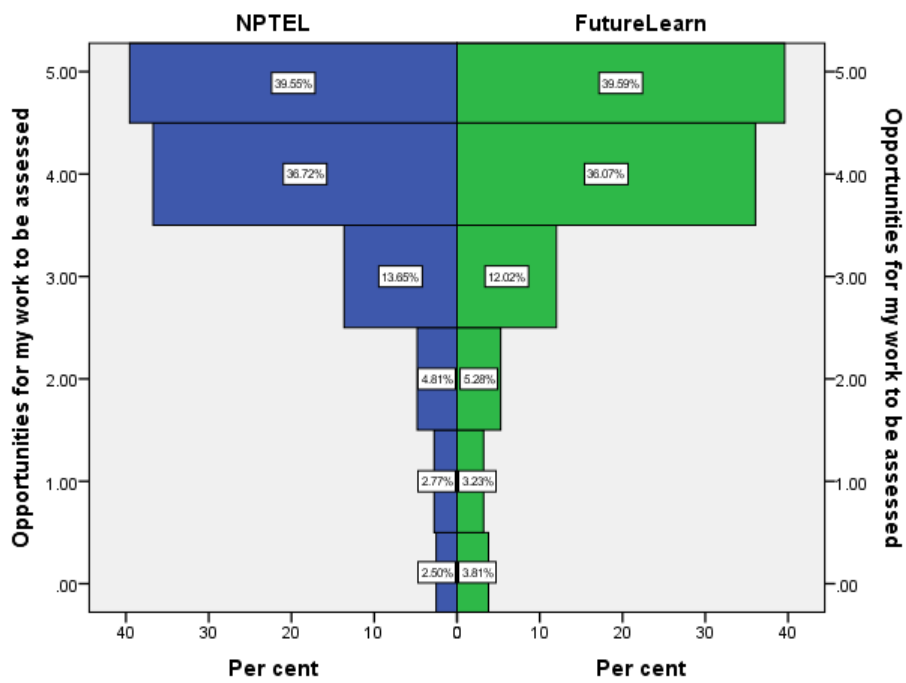| Total N	1,959
Mann-Whitney U	212,905.500
Wilcoxon W	269,521.500
Test Statistic	212,905.500
Standard Error	8,912.563
Standardized Test Statistic	-6.705
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType
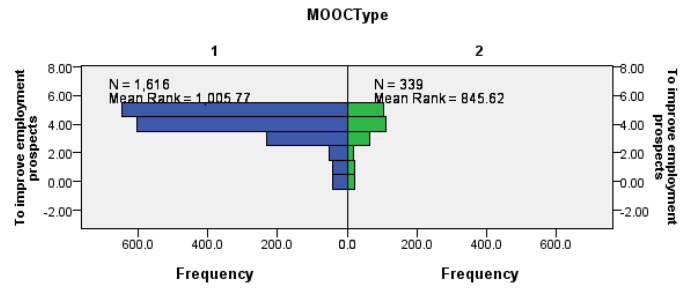
Total N	1,955
Mann-Whitney U	229,034.000
Wilcoxon W	286,664.000
Test Statistic	229,034.000
Standard Error	8,919.111
Standardized Test Statistic	-5.032
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test
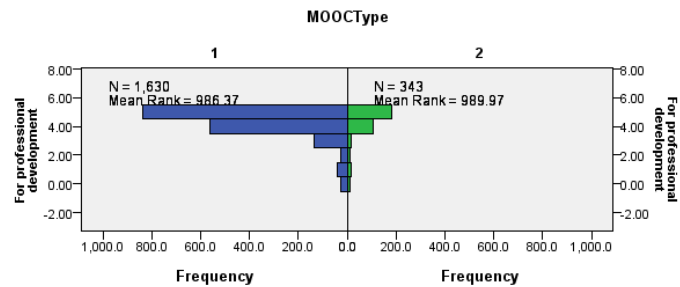
MOOCType

Total N	1,973
Mann-Whitney U	280,564.500
Wilcoxon W	339,560.500
Test Statistic	280,564.500
Standard Error	8,691.110
Standardized Test Statistic	.117
Asymptotic Sig. (2-sided test)	.907

Independent-Samples Mann-Whitney U Test
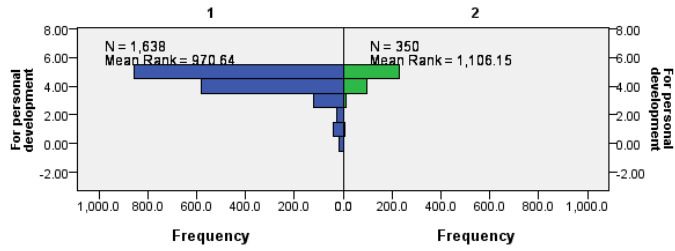
MOOCType

Total N	1,988
Mann-Whitney U	325,726.000
Wilcoxon W	387,151.000
Test Statistic	325,726.000
Standard Error	8,713.302
Standardized Test Statistic	4.485
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType
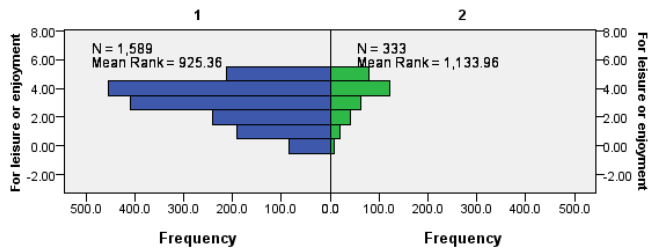
Total N	1,922
Mann-Whitney U	321,997.500
Wilcoxon W	377,608.500
Test Statistic	321,997.500
Standard Error	8,977.383
Standardized Test Statistic	6.397
Asymptotic Sig. (2-sided test)	.000

362

Independent-Samples Mann-Whitney U Test

MOOCType
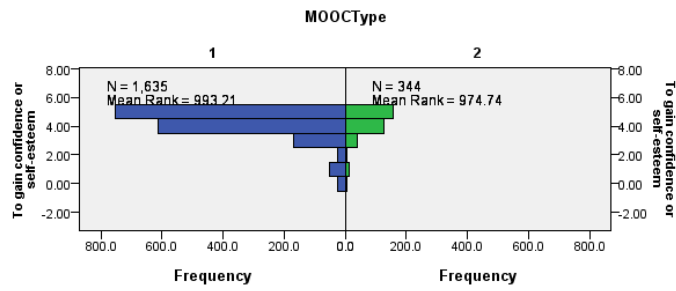
Total N	1,979
Mann-Whitney U	275,970.500
Wilcoxon W	335,310.500
Test Statistic	275,970.500
Standard Error	8,885.997
Standardized Test Statistic	-.591
Asymptotic Sig. (2-sided test)	.555

Independent-Samples Mann-Whitney U Test

MOOCType
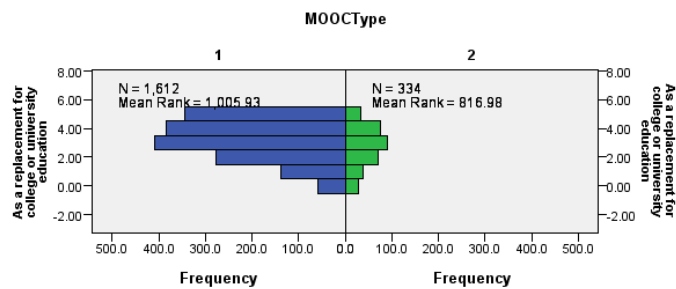
Total N	1,946
Mann-Whitney U	216,925.000
Wilcoxon W	272,870.000
Test Statistic	216,925.000
Standard Error	9,139.667
Standardized Test Statistic	-5.720
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType
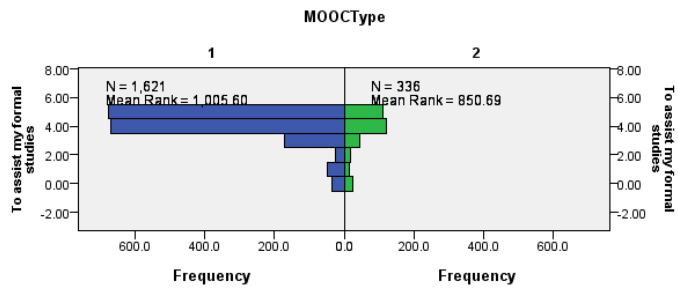
Total N	1,957
Mann-Whitney U	229,215.500
Wilcoxon W	285,831.500
Test Statistic	229,215.500
Standard Error	8,784.110
Standardized Test Statistic	-4.908
Asymptotic Sig. (2-sided test)	.000

Appendix 15 – Histogram Comparison of Experience Likert-type items

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NPTEL — FutureLearn

Opportunities for interaction with the instructor

	NPTEL	FutureLearn
5.00	40.92%	37.57%
4.00	35.20%	40.53%
3.00	14.14%	13.61%
2.00	5.99%	6.51%
1.00	2.11%	1.18%
.00	1.64%	0.59%

Per cent

NPTEL — FutureLearn

Being able to access the materials at any time

	NPTEL	FutureLearn
5.00	66.97%	71.13%
4.00	25.69%	22.92%
3.00	3.93%	3.57%
2.00	1.90%	0.89%
1.00	0.85%	0.30%
.00	0.66%	1.19%

Per cent

370
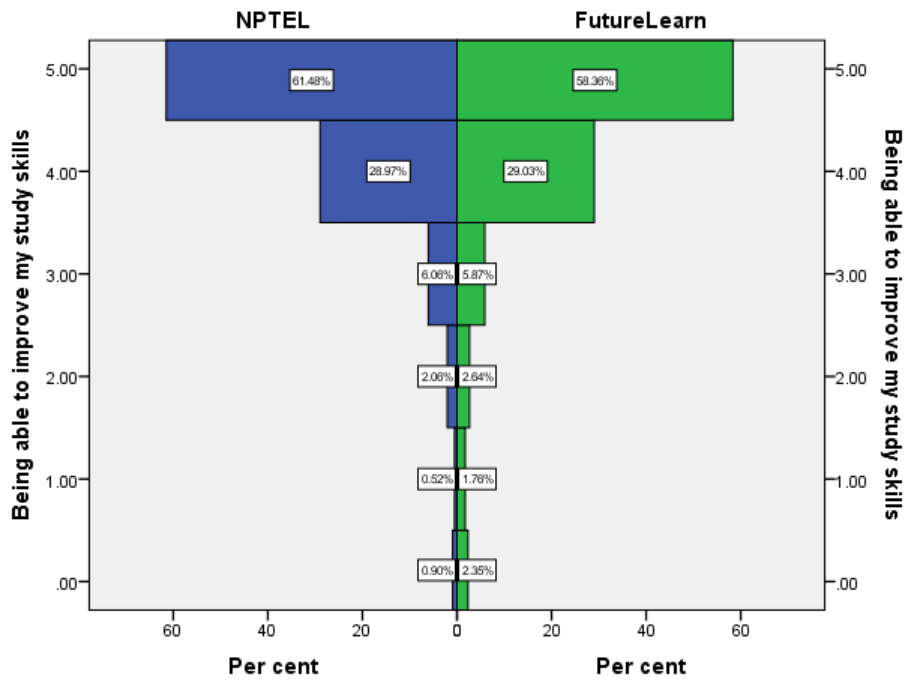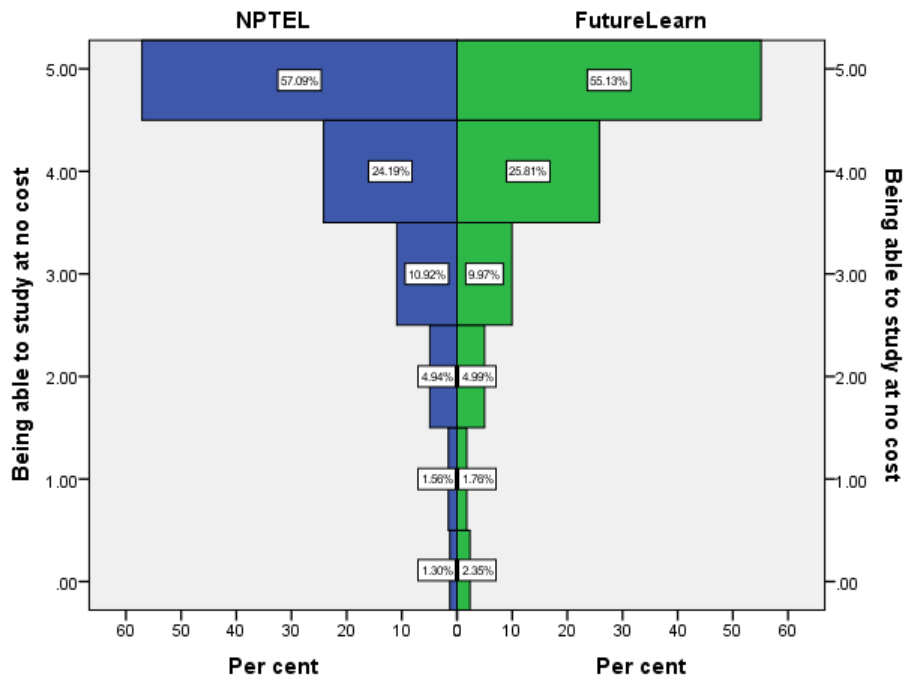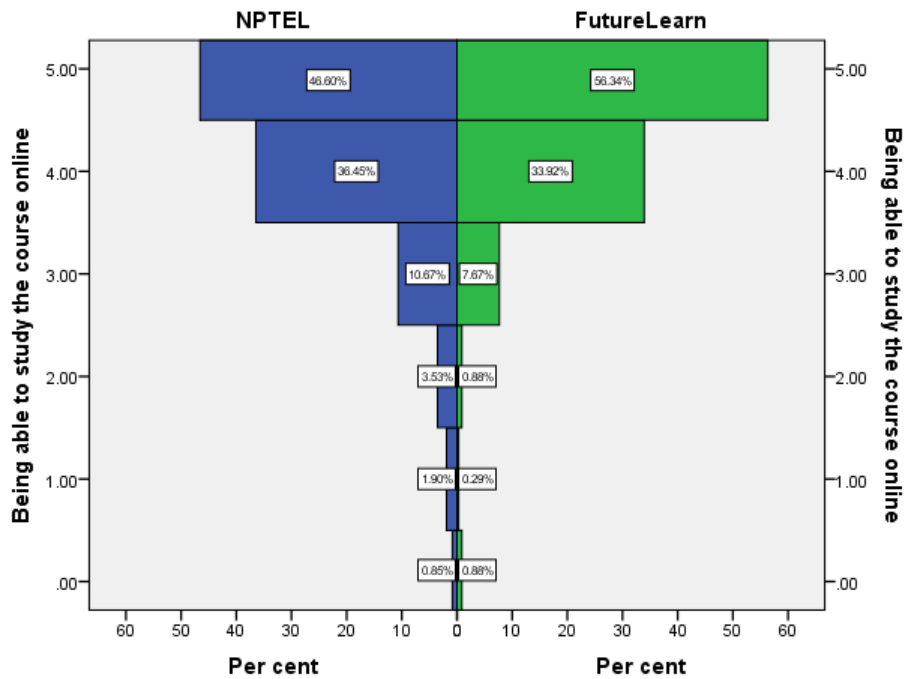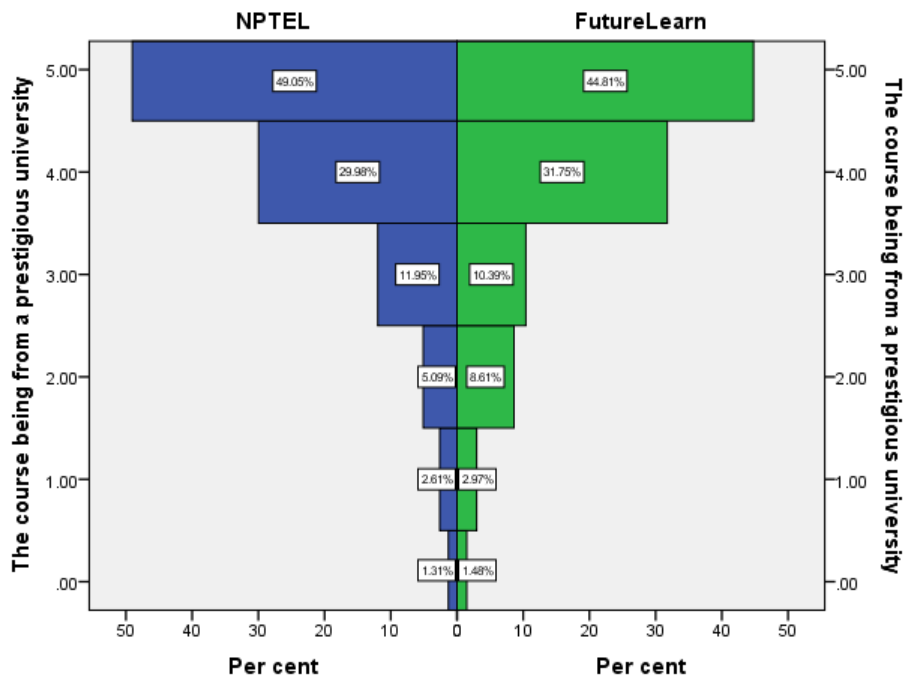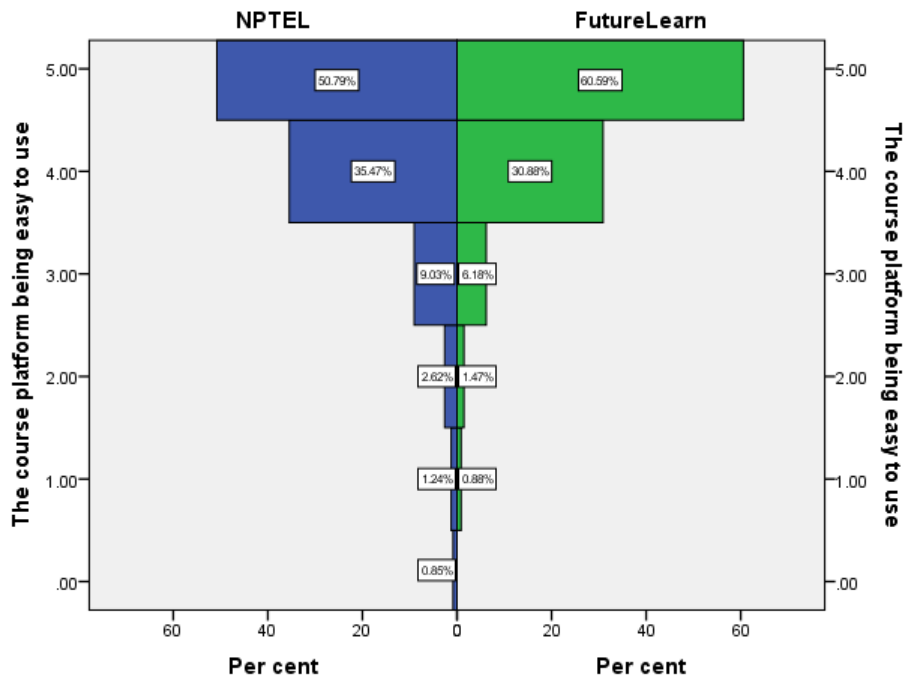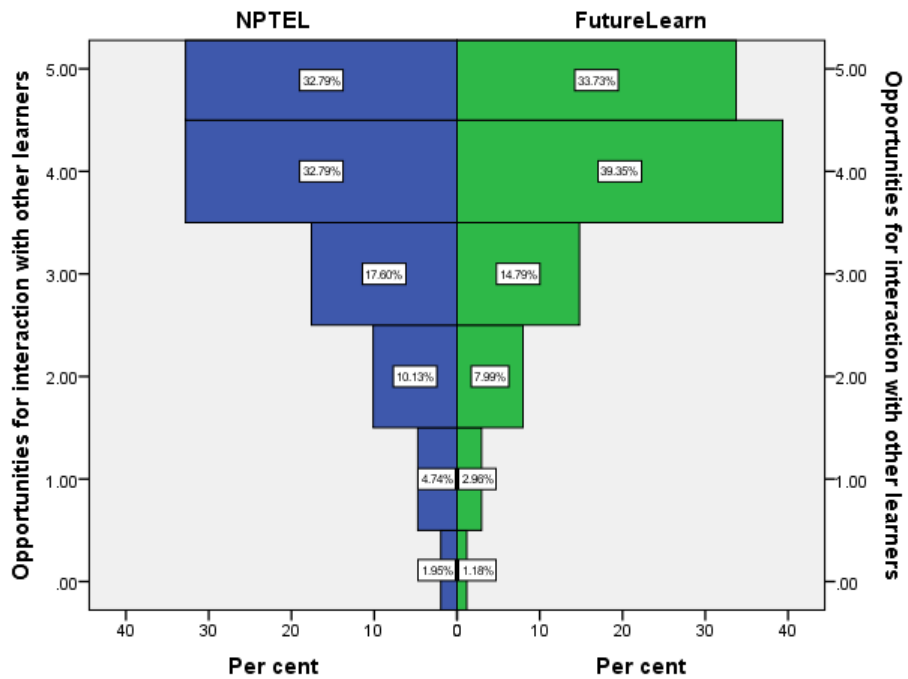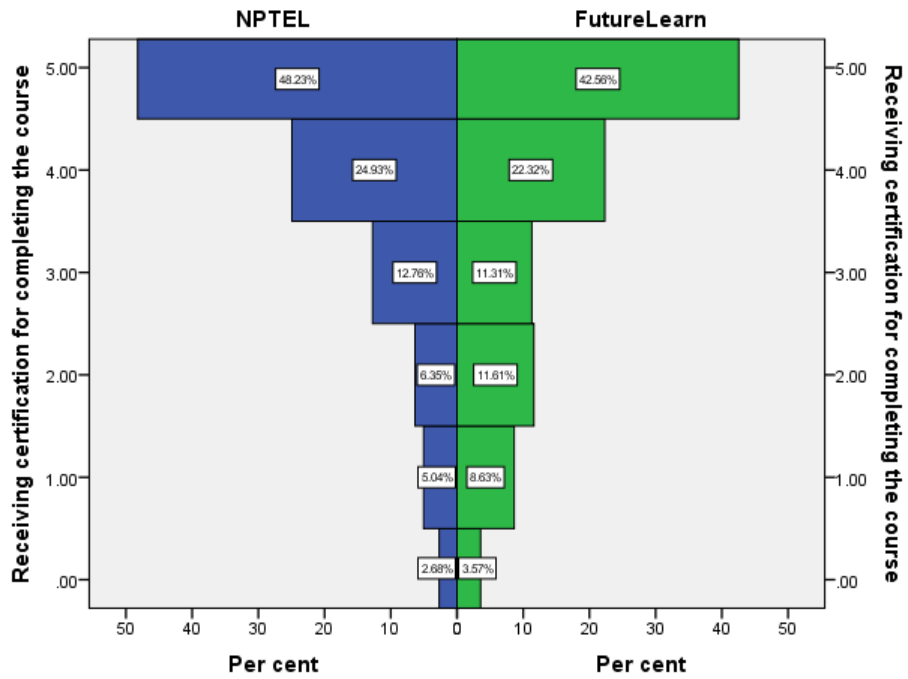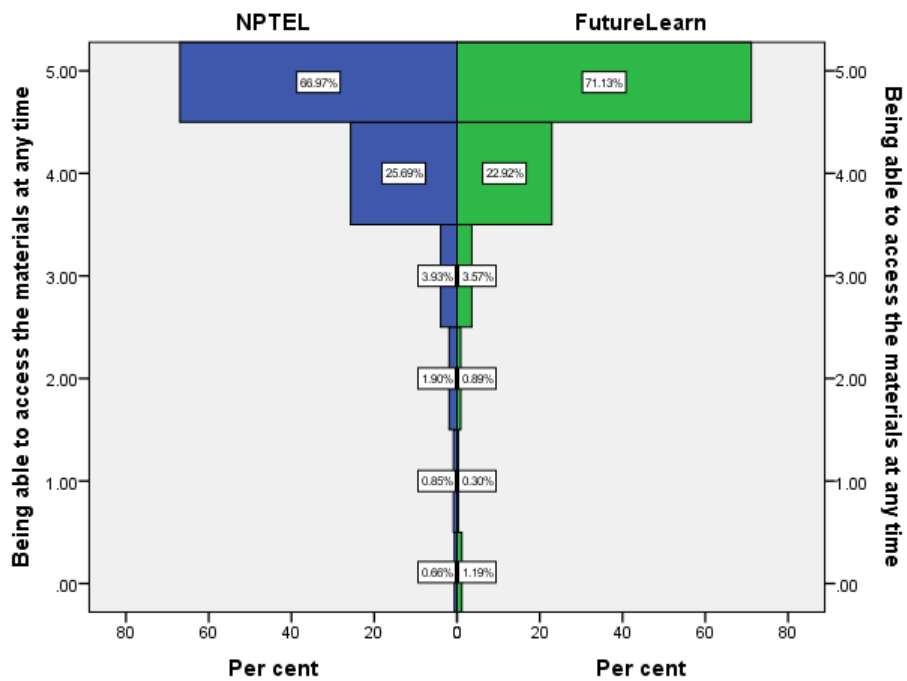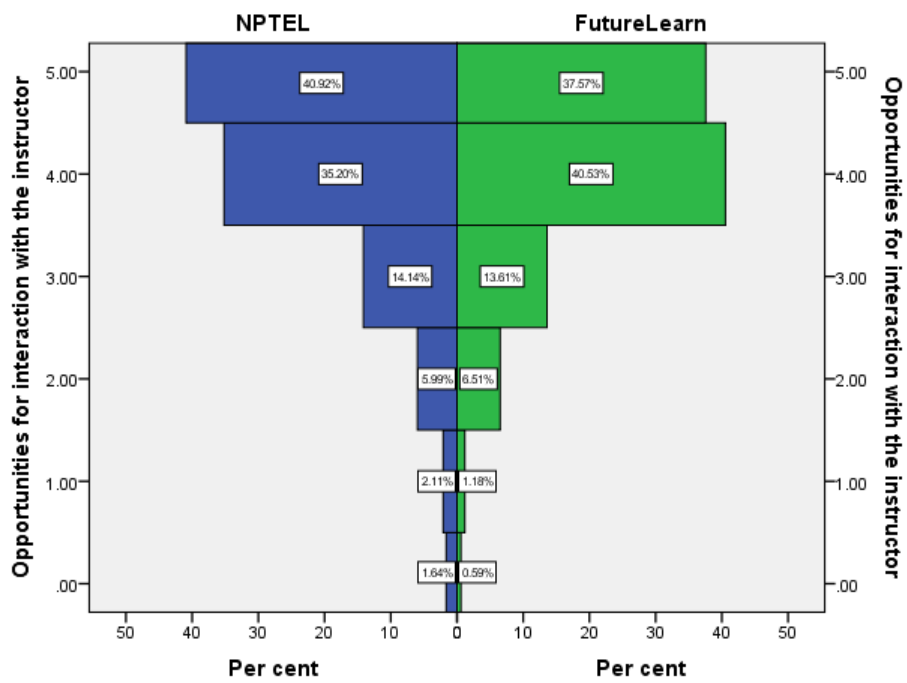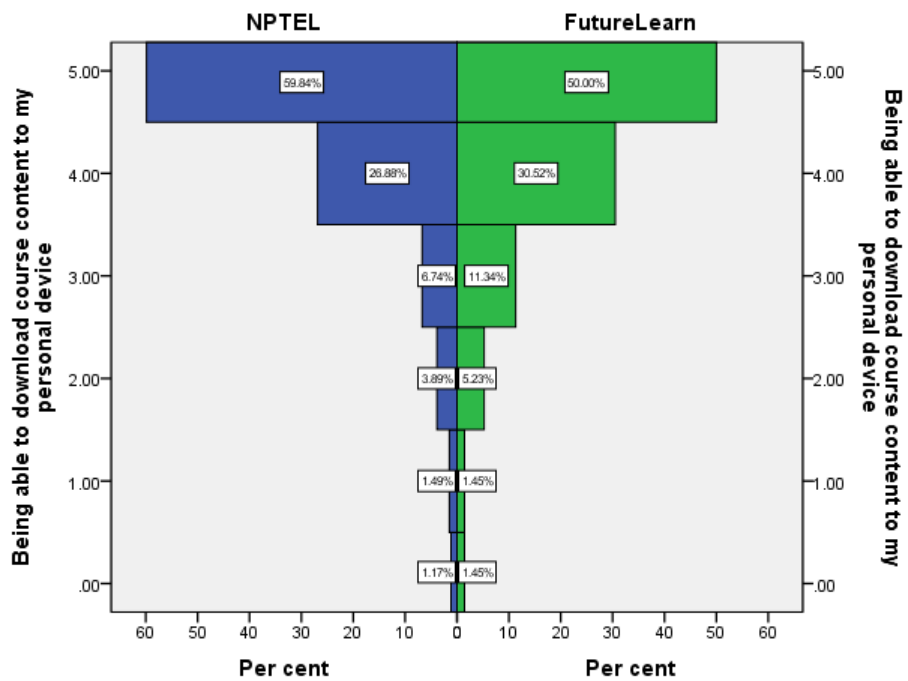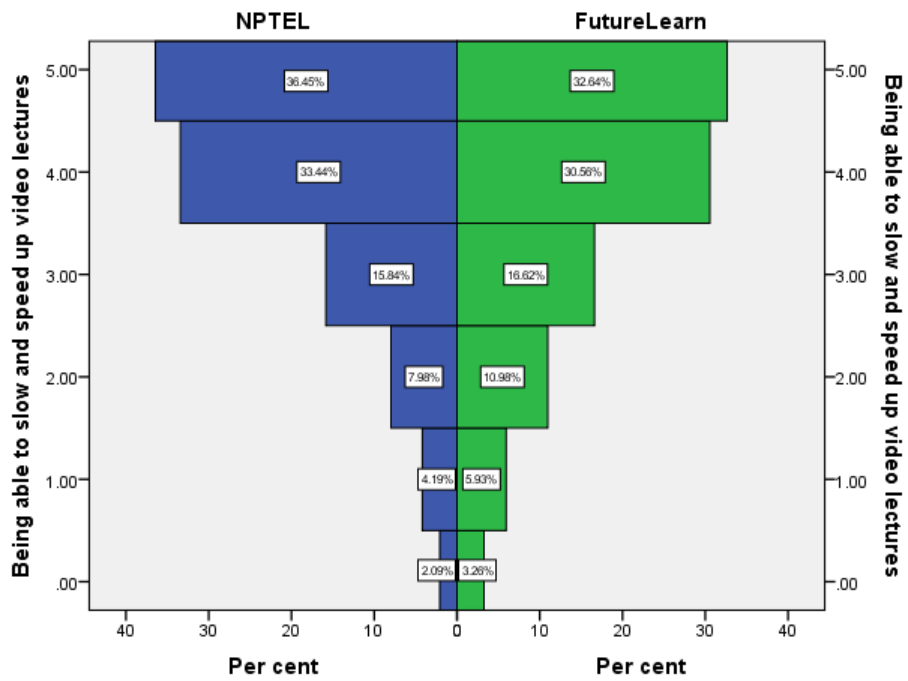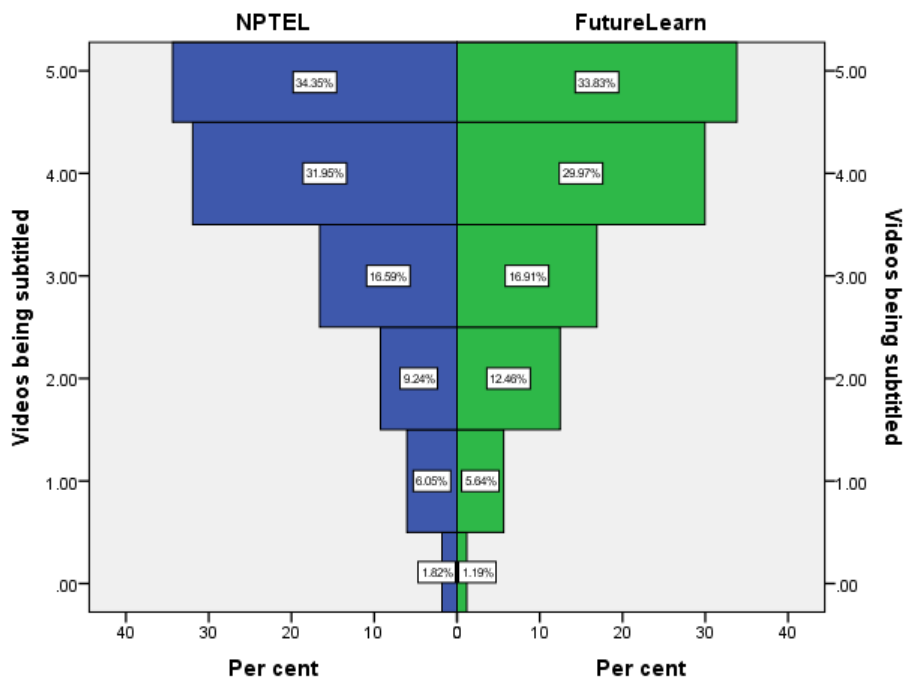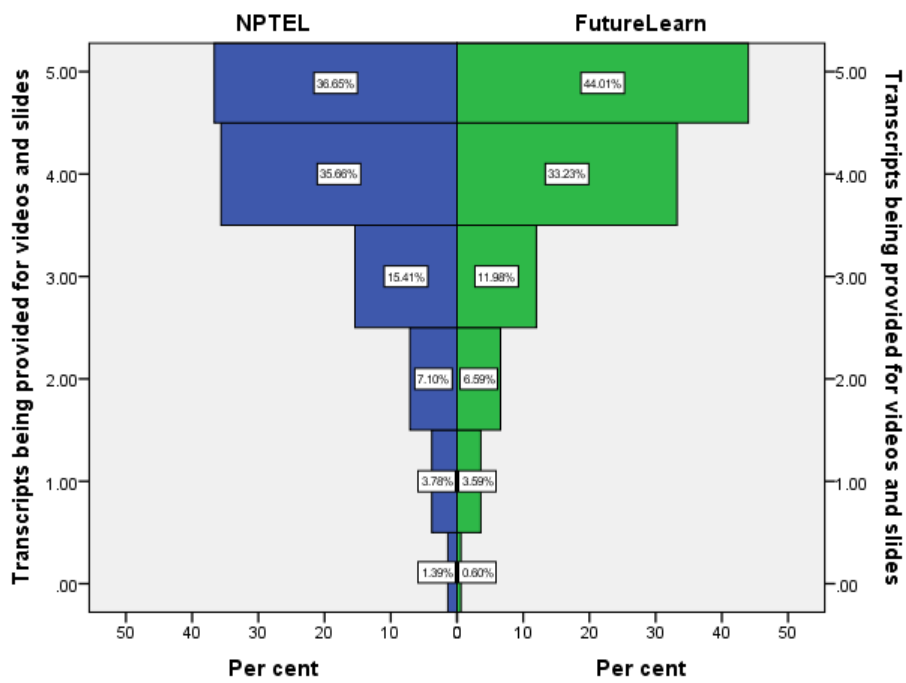
Appendix 16: Test of Normality for Experience Likert-type Items

Tests of Normality

| | Kolmogorov-Smirnov[a] | | | | | | Shapiro-Wilk | | | | | |
| | Statistic | | df | | Sig. | | Statistic | | df | | Sig. | |
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
Being able to study at no cost	.329	.305	1375	308	0.000	.000	.706	.705	1375	308	.000	.000
Being able to improve my study skills	.350	.318	1375	308	0.000	.000	.641	.640	1375	308	.000	.000
The course being from a prestigious university	.274	.258	1375	308	.000	.000	.754	.771	1375	308	.000	.000
Being able to study the course online	.262	.320	1375	308	.000	.000	.749	.667	1375	308	.000	.000
The course being of a high quality	.321	.386	1375	308	0.000	.000	.684	.594	1375	308	.000	.000
The course platform being easy to use	.286	.366	1375	308	.000	.000	.722	.677	1375	308	.000	.000

| | Kolmogorov-Smirnov[a] | | | | | | Shapiro-Wilk | | | | | |
| | Statistic | | df | | Sig. | | Statistic | | df | | Sig. | |
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
Opportunities for my work to be assessed	.269	.284	1375	308	.000	.000	.779	.760	1375	308	.000	.000
Being able to try university-level content for free before signing up for a formal course	.251	.233	1375	308	.000	.000	.801	.828	1375	308	.000	.000
Receiving certification for completing the course	.272	.236	1375	308	.000	.000	.759	.816	1375	308	.000	.000
Opportunities for interaction with other learners	.242	.267	1375	308	.000	.000	.849	.828	1375	308	.000	.000

Tests of Normality

| | Kolmogorov-Smirnov[a] | | | | | | Shapiro-Wilk | | | | | |
| | Statistic | | df | | Sig. | | Statistic | | df | | Sig. | |
	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn	NPTEL	FutureLearn
Opportunities for interaction with the instructor	.251	.265	1375	308	.000	.000	.791	.812	1375	308	.000	.000
Being able to access the materials at any time	.388	.397	1375	308	0.000	.000	.593	.532	1375	308	.000	.000
Being able to slow and speed up video lectures	.252	.237	1375	308	.000	.000	.826	.851	1375	308	.000	.000
Being able to download course content to my personal device	.340	.281	1375	308	0.000	.000	.664	.749	1375	308	.000	.000
Transcripts being provided for videos and slides	.257	.254	1375	308	.000	.000	.818	.784	1375	308	.000	.000
Videos being subtitled	.244	.225	1375	308	.000	.000	.842	.859	1375	308	.000	.000

a. Lilliefors Significance Correction

Appendix 17: Mann-Whitney U-Test for Experience Likert-type items

Note: MOOCType 1 = NPTEL Sample MOOCType 2 = FutureLearn
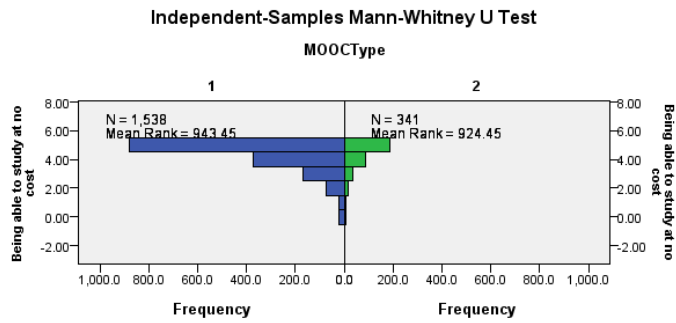
Total N	1,879
Mann-Whitney U	256,926.000
Wilcoxon W	315,237.000
Test Statistic	256,926.000
Standard Error	8,114.425
Standardized Test Statistic	-.654
Asymptotic Sig. (2-sided test)	.513

Independent-Samples Mann-Whitney U Test

MOOCType
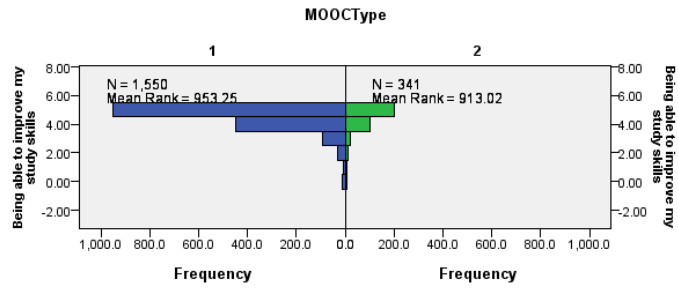
Total N	1,891
Mann-Whitney U	253,030.000
Wilcoxon W	311,341.000
Test Statistic	253,030.000
Standard Error	7,902.287
Standardized Test Statistic	-1.423
Asymptotic Sig. (2-sided test)	.155

Independent-Samples Mann-Whitney U Test

MOOCType
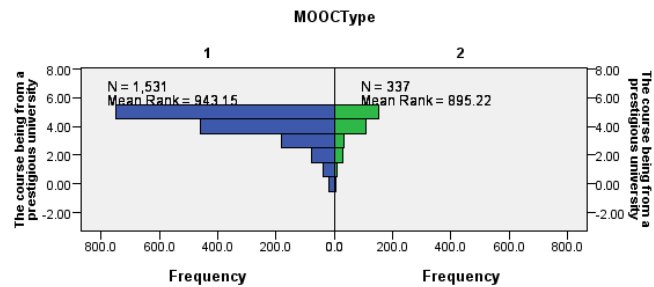
Total N	1,868
Mann-Whitney U	244,737.500
Wilcoxon W	301,690.500
Test Statistic	244,737.500
Standard Error	8,302.497
Standardized Test Statistic	-1.594
Asymptotic Sig. (2-sided test)	.111

Independent-Samples Mann-Whitney U Test
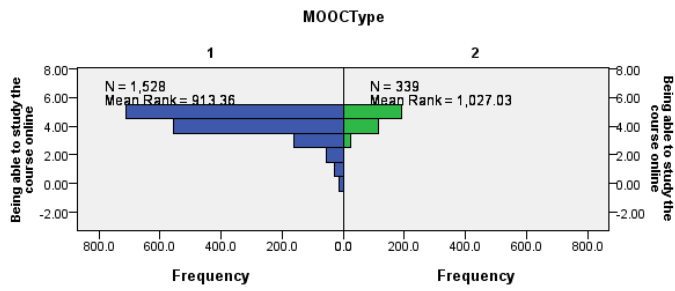
Total N	1,867
Mann-Whitney U	290,533.500
Wilcoxon W	348,163.500
Test Statistic	290,533.500
Standard Error	8,225.843
Standardized Test Statistic	3.834
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test
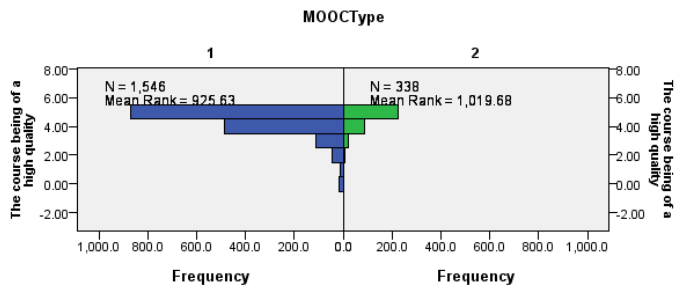
Total N	1,884
Mann-Whitney U	287,359.500
Wilcoxon W	344,650.500
Test Statistic	287,359.500
Standard Error	7,976.010
Standardized Test Statistic	3.270
Asymptotic Sig. (2-sided test)	.001

378

Independent-Samples Mann-Whitney U Test

MOOCType
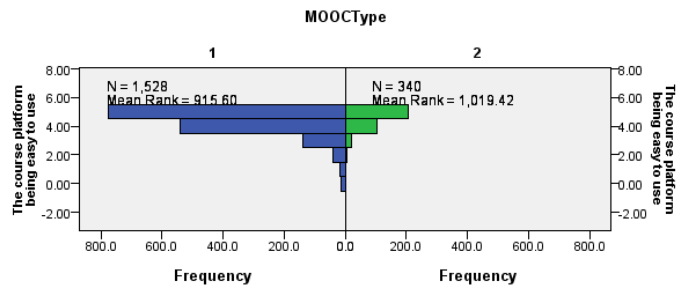
Total N	1,868
Mann-Whitney U	288,633.500
Wilcoxon W	346,603.500
Test Statistic	288,633.500
Standard Error	8,108.430
Standardized Test Statistic	3.561
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType
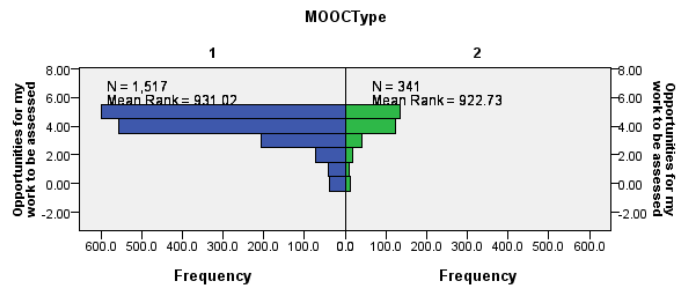
Total N	1,858
Mann-Whitney U	256,340.000
Wilcoxon W	314,651.000
Test Statistic	256,340.000
Standard Error	8,428.820
Standardized Test Statistic	-.274
Asymptotic Sig. (2-sided test)	.784

Independent-Samples Mann-Whitney U Test

MOOCType
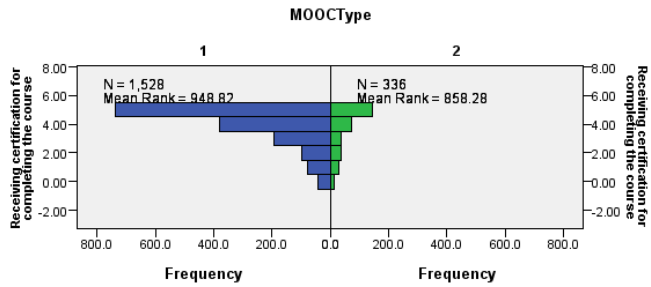
Total N	1,864
Mann-Whitney U	231,766.000
Wilcoxon W	288,382.000
Test Statistic	231,766.000
Standard Error	8,368.075
Standardized Test Statistic	-2.980
Asymptotic Sig. (2-sided test)	.003

Independent-Samples Mann-Whitney U Test
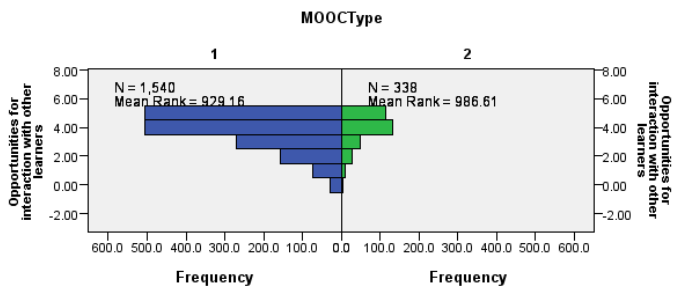
MOOCType

Total N	1,878
Mann-Whitney U	276,184.500
Wilcoxon W	333,475.500
Test Statistic	276,184.500
Standard Error	8,654.515
Standardized Test Statistic	1.840
Asymptotic Sig. (2-sided test)	.066

Independent-Samples Mann-Whitney U Test

MOOCType
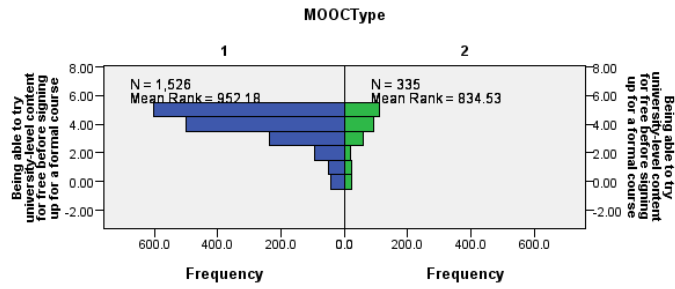
Total N	1,861
Mann-Whitney U	223,288.500
Wilcoxon W	279,568.500
Test Statistic	223,288.500
Standard Error	8,480.624
Standardized Test Statistic	-3.811
Asymptotic Sig. (2-sided test)	.000
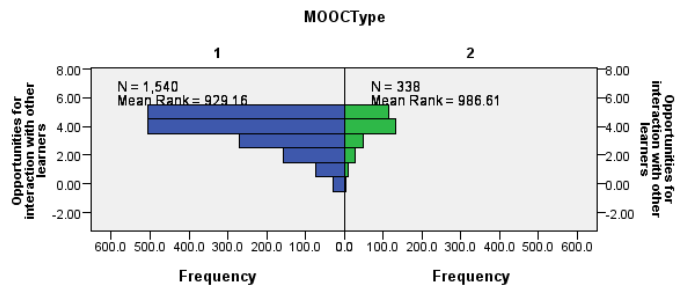
Independent-Samples Mann-Whitney U Test

MOOCType

Total N	1,878
Mann-Whitney U	276,184.500
Wilcoxon W	333,475.500
Test Statistic	276,184.500
Standard Error	8,654.515
Standardized Test Statistic	1.840
Asymptotic Sig. (2-sided test)	.066

Independent-Samples Mann-Whitney U Test

MOOCType
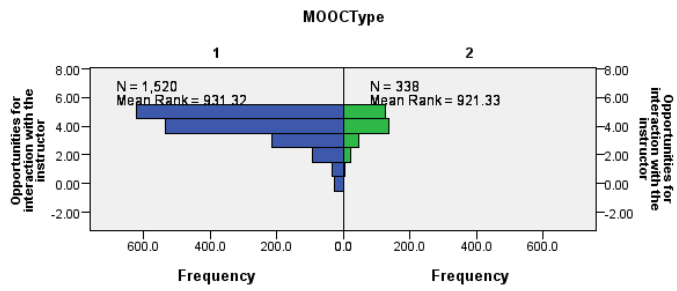
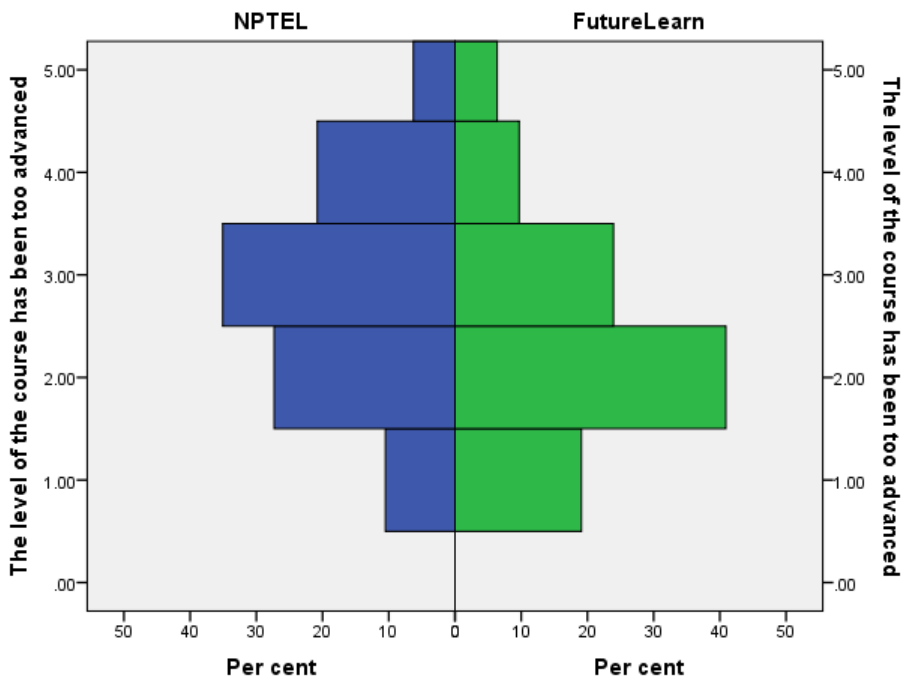| Total N	1,858
Mann-Whitney U	254,118.500
Wilcoxon W	311,409.500
Test Statistic	254,118.500
Standard Error	8,388.752
Standardized Test Statistic	-.329
Asymptotic Sig. (2-sided test)	.742

Independent-Samples Mann-Whitney U Test

MOOCType
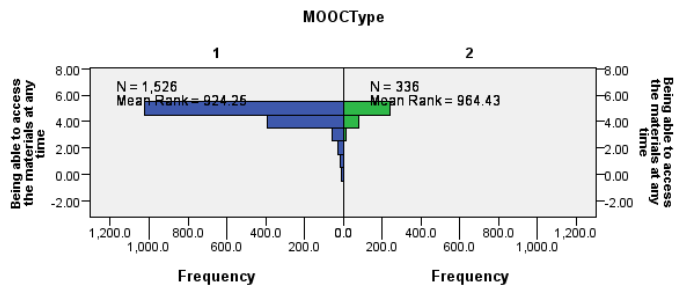
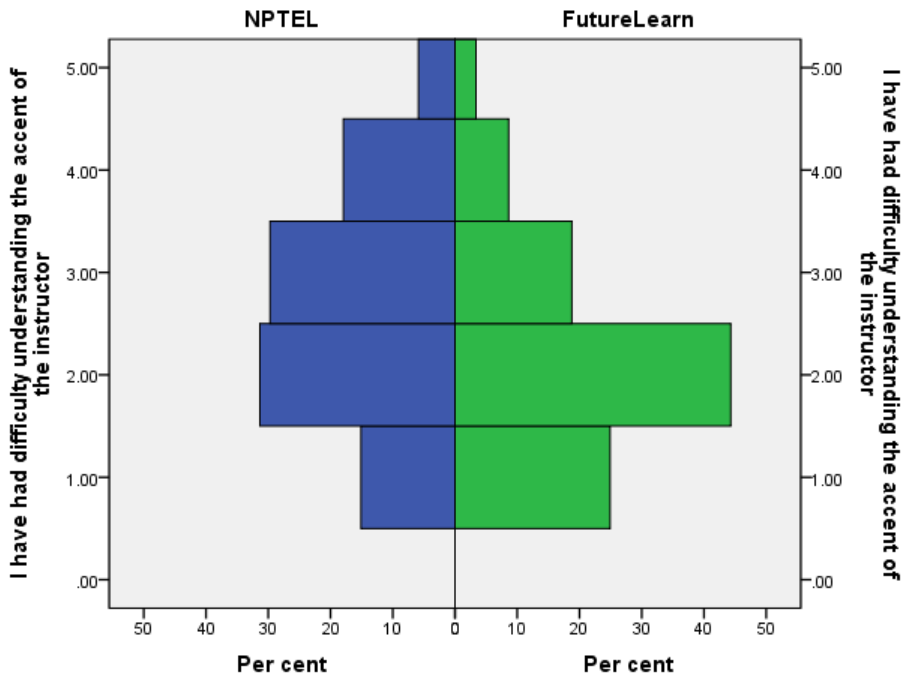| Total N	1,862
Mann-Whitney U	267,434.000
Wilcoxon W	324,050.000
Test Statistic	267,434.000
Standard Error	7,321.231
Standardized Test Statistic	1.511
Asymptotic Sig. (2-sided test)	.131

382

Independent-Samples Mann-Whitney U Test

MOOCType
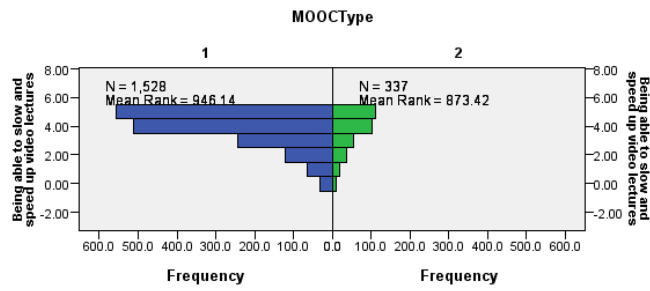
Total N	1,865
Mann-Whitney U	237,390.500
Wilcoxon W	294,343.500
Test Statistic	237,390.500
Standard Error	8,553.819
Standardized Test Statistic	-2.347
Asymptotic Sig. (2-sided test)	.019

Independent-Samples Mann-Whitney U Test

MOOCType
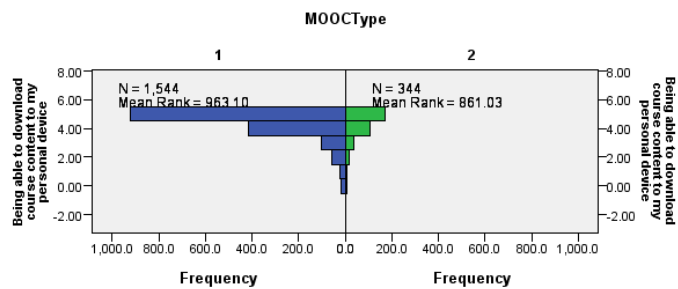
Total N	1,888
Mann-Whitney U	236,854.000
Wilcoxon W	296,194.000
Test Statistic	236,854.000
Standard Error	8,090.981
Standardized Test Statistic	-3.549
Asymptotic Sig. (2-sided test)	.000

383

Independent-Samples Mann-Whitney U Test

MOOCType
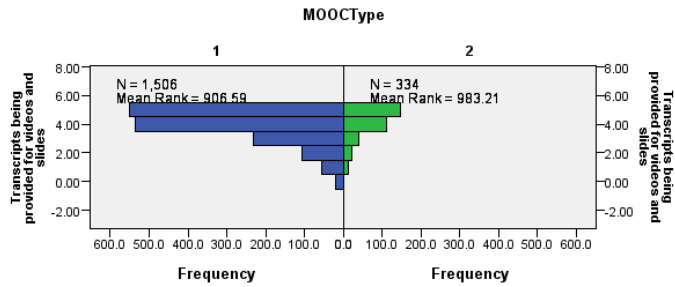
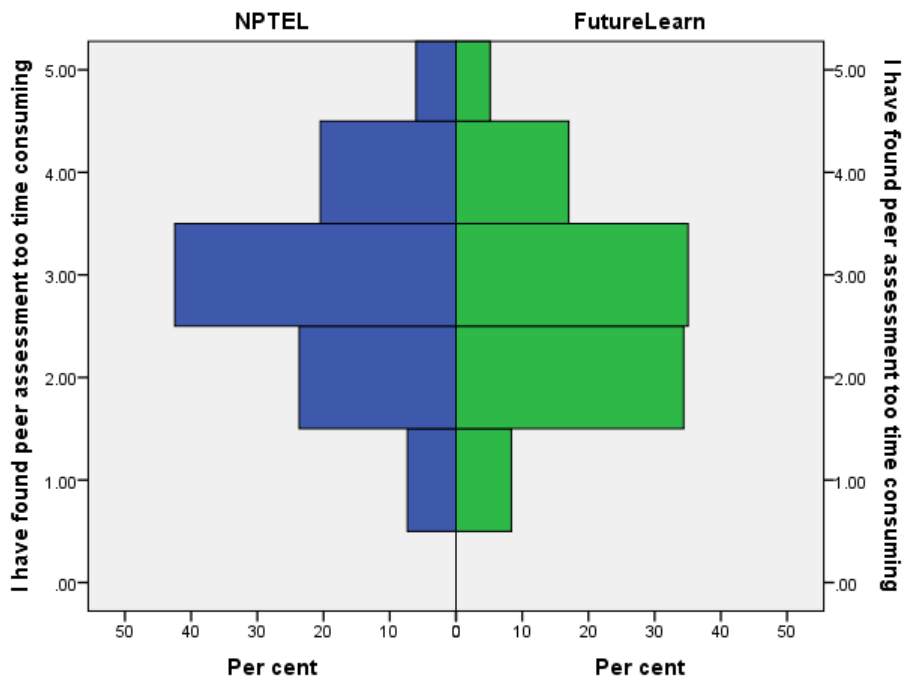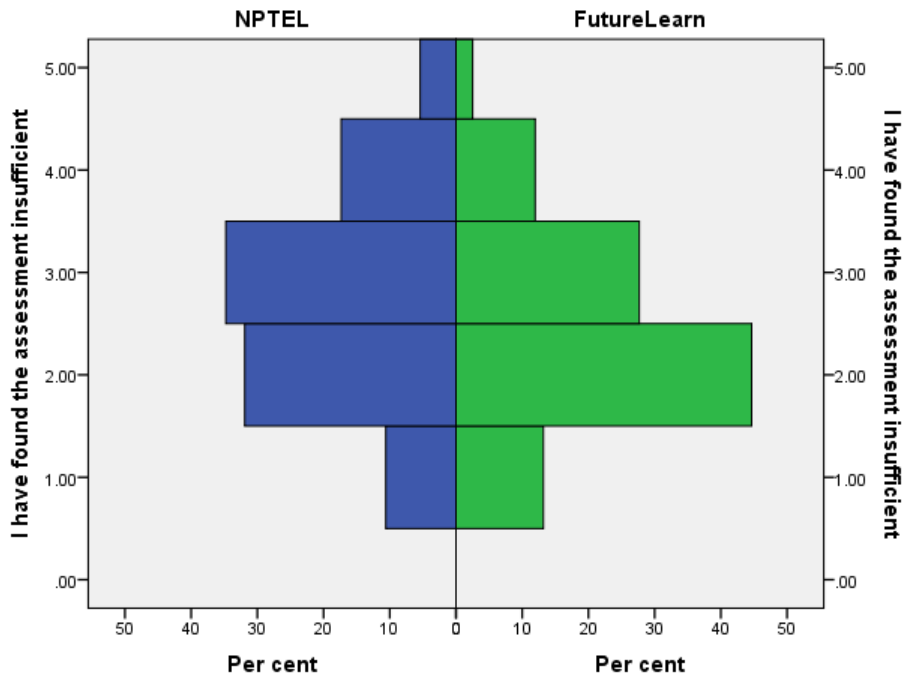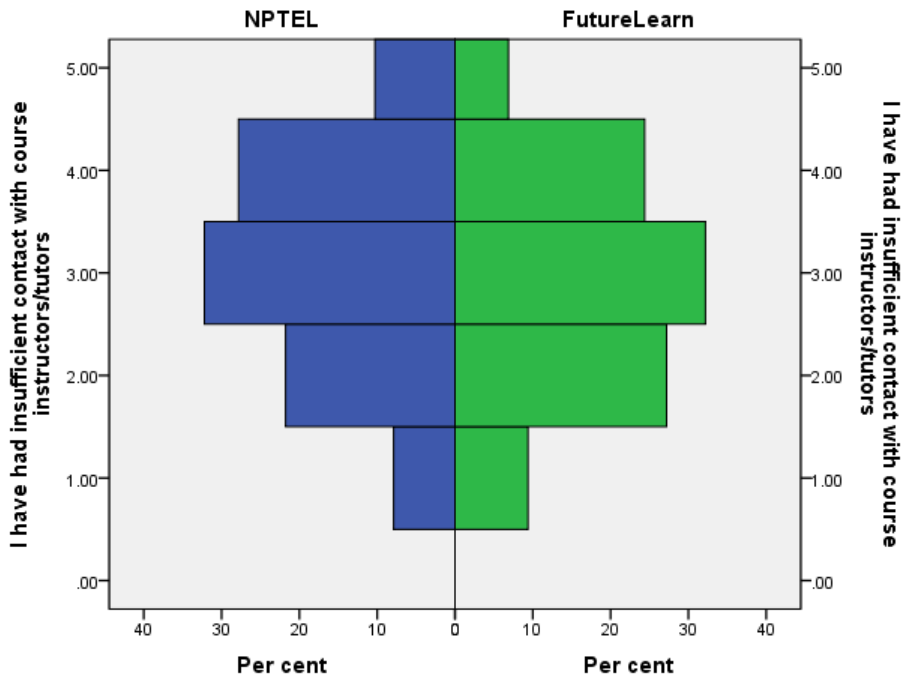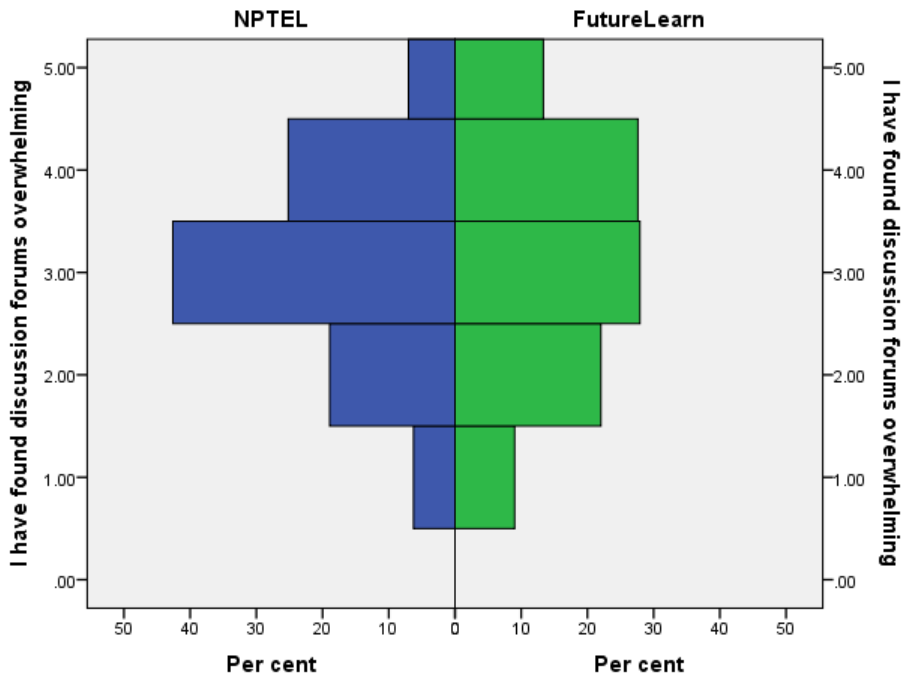| Total N	1,840
Mann-Whitney U	272,448.500
Wilcoxon W	328,393.500
Test Statistic	272,448.500
Standard Error	8,323.921
Standardized Test Statistic	2.516
Asymptotic Sig. (2-sided test)	.012

Independent-Samples Mann-Whitney U Test

MOOCType
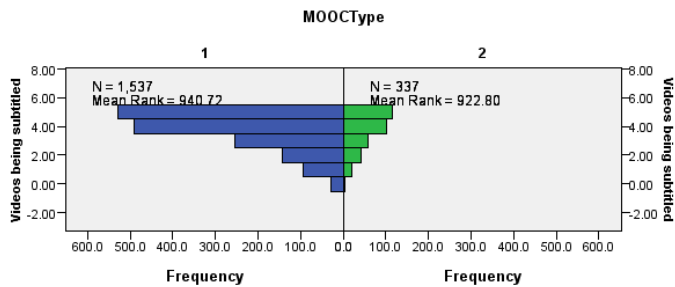
Total N	1,874
Mann-Whitney U	254,029.500
Wilcoxon W	310,982.500
Test Statistic	254,029.500
Standard Error	8,640.571
Standardized Test Statistic	-.573
Asymptotic Sig. (2-sided test)	.566

# Appendix 18: Histogram Comparison of Challenges Likert-type items

NPTEL   FutureLearn

I have found discussion forums overwhelming

Per cent   Per cent

NPTEL   FutureLearn

I have had insufficient contact with course instructors/tutors

Per cent   Per cent

388
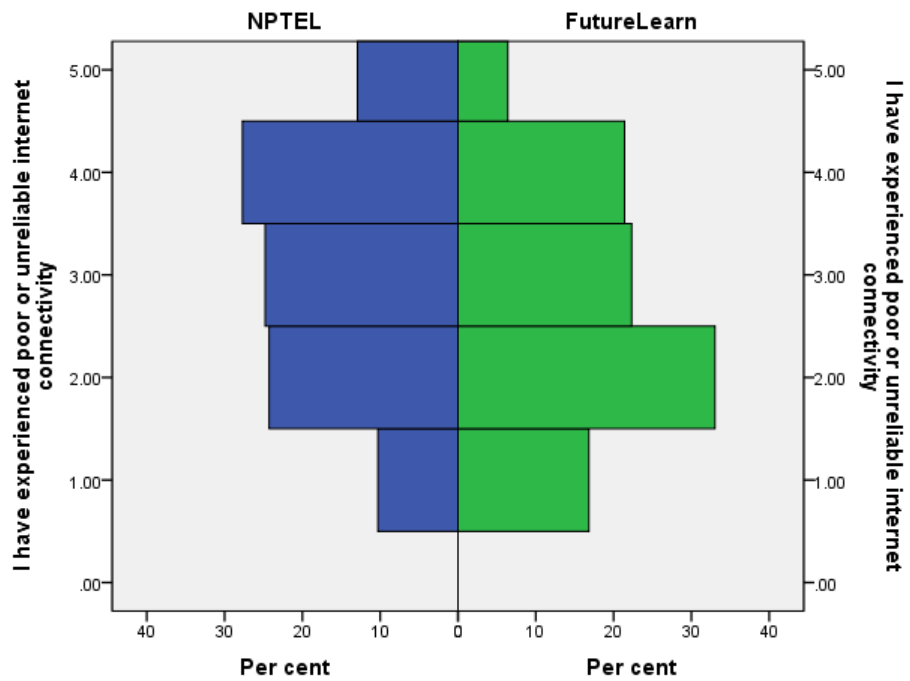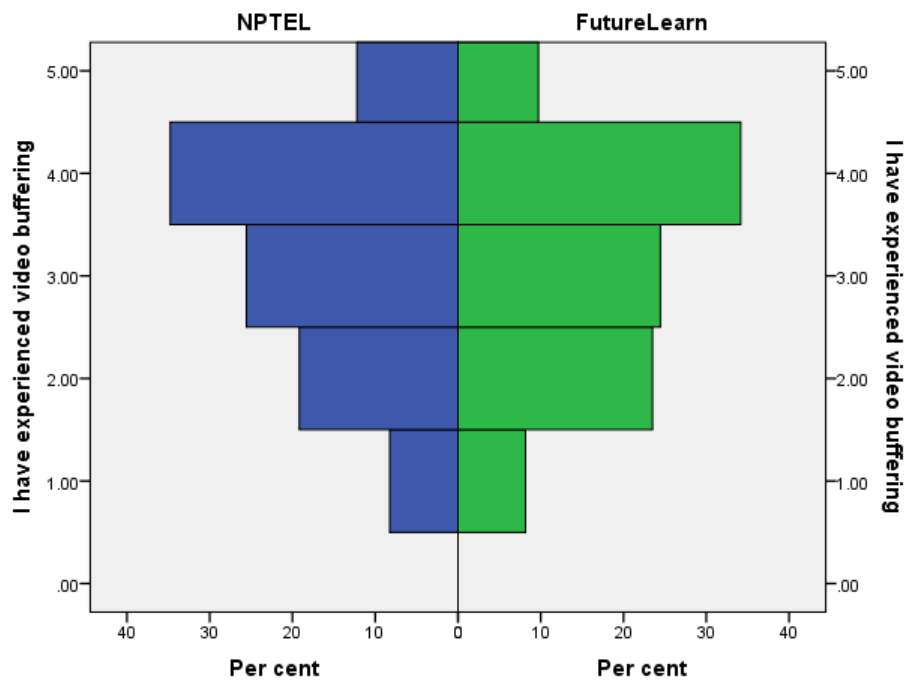
Appendix 19: Tests for Normality for Challenges Likert-type items

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
MOOCType		Statistic	df	Sig.	Statistic	df	Sig.
I have experienced video buffering	NPTEL	.222	1135	.000	.903	1135	.000
	FutureLearn	.221	279	.000	.902	279	.000
I have experienced poor or unreliable internet connectivity	NPTEL	.175	1135	.000	.913	1135	.000
	FutureLearn	.221	279	.000	.903	279	.000
I have had difficulty understanding the accent of the	NPTEL	.195	1135	.000	.910	1135	.000
	FutureLearn	.278	279	.000	.851	279	.000
The level of the course has been too advanced	NPTEL	.175	1135	.000	.914	1135	.000
	FutureLearn	.253	279	.000	.880	279	.000
I have found the assessment insufficient	NPTEL	.190	1135	.000	.908	1135	.000
	FutureLearn	.269	279	.000	.877	279	.000
I have found the assessment too challenging	NPTEL	.209	1135	.000	.908	1135	.000
	FutureLearn	.259	279	.000	.884	279	.000
I have found peer assessment too time consuming	NPTEL	.215	1135	.000	.905	1135	.000
	FutureLearn	.213	279	.000	.900	279	.000
I have found discussion forums overwhelming	NPTEL	.215	1135	.000	.905	1135	.000
	FutureLearn	.175	279	.000	.915	279	.000
I have had insufficient contact with course instructors/tutors	NPTEL	.173	1135	.000	.915	1135	.000
	FutureLearn	.175	279	.000	.914	279	.000

Tests of Normality

a. Lilliefors Significance Correction

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Appendix 20: Mann-Whitney U-Test of Challenge Likert-type items

Independent-Samples Mann-Whitney U Test

MOOCType
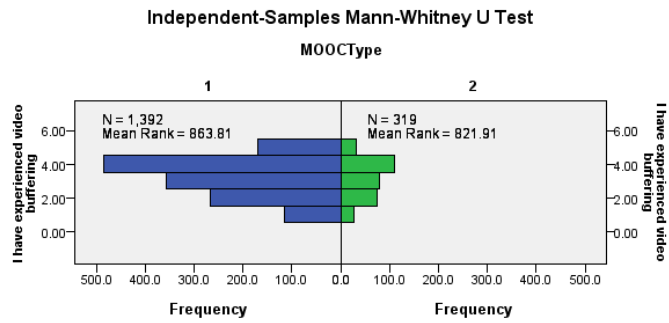
Total N	1,711
Mann-Whitney U	211,149.500
Wilcoxon W	262,189.500
Test Statistic	211,149.500
Standard Error	7,683.461
Standardized Test Statistic	-1.415
Asymptotic Sig. (2-sided test)	.157

Independent-Samples Mann-Whitney U Test

MOOCType
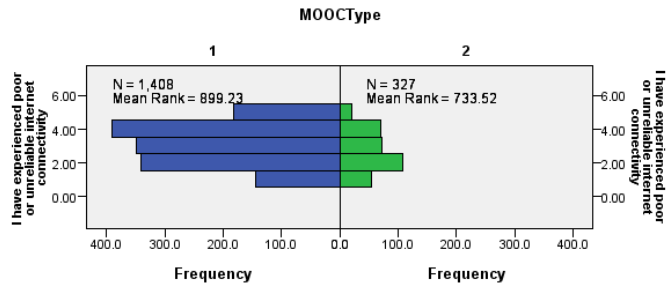
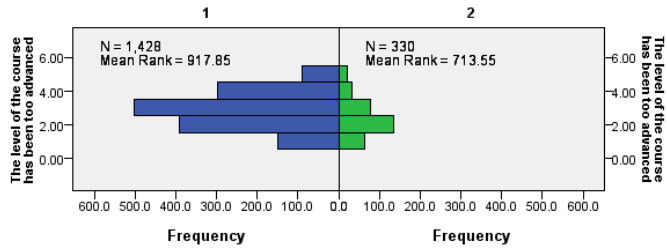| Total N	1,735
Mann-Whitney U	186,232.000
Wilcoxon W	239,860.000
Test Statistic	186,232.000
Standard Error	7,939.537
Standardized Test Statistic	-5.539
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test
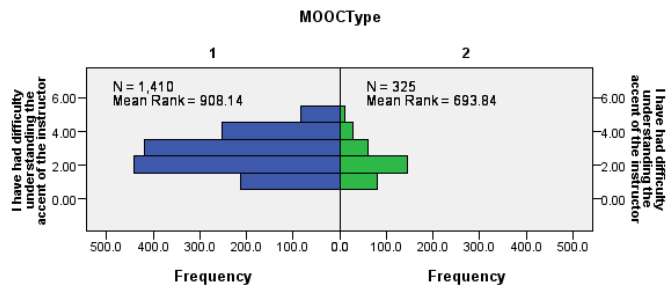
MOOCType

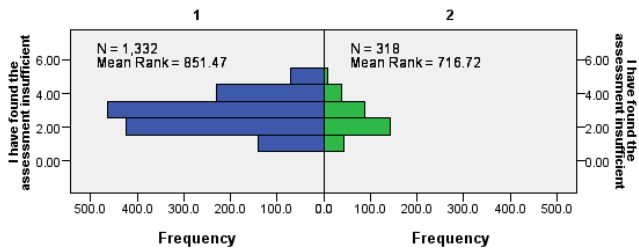| Total N	1,735
Mann-Whitney U	172,524.500
Wilcoxon W	225,499.500
Test Statistic	172,524.500
Standard Error	7,856.255
Standardized Test Statistic	-7.205
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType

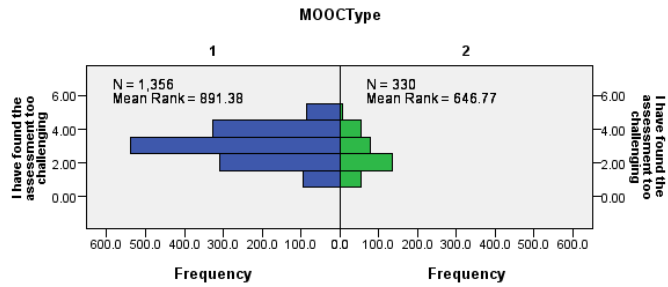|	
Total N	1,758
Mann-Whitney U	180,856.500
Wilcoxon W	235,471.500
Test Statistic	180,856.500
Standard Error	8,010.160
Standardized Test Statistic	-6.837
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test

MOOCType

Total N	1,650
Mann-Whitney U	177,197.000
Wilcoxon W	227,918.000
Test Statistic	177,197.000
Standard Error	7,307.759
Standardized Test Statistic	-4.733
Asymptotic Sig. (2-sided test)	.000

392

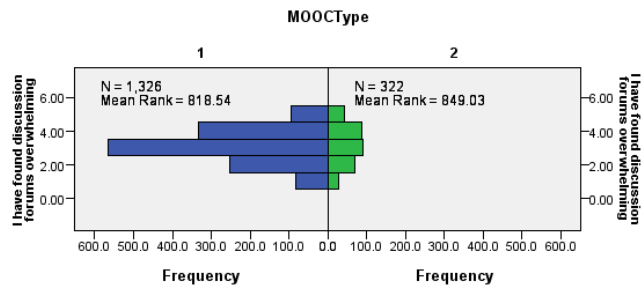Independent-Samples Mann-Whitney U Test

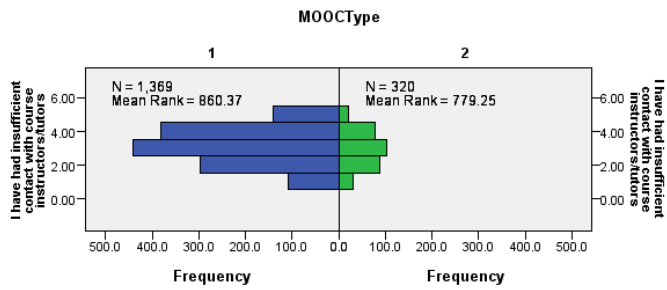| Total N	1,686
Mann-Whitney U	158,819.500
Wilcoxon W	213,434.500
Test Statistic	158,819.500
Standard Error	7,607.324
Standardized Test Statistic	-8.534
Asymptotic Sig. (2-sided test)	.000

Independent-Samples Mann-Whitney U Test
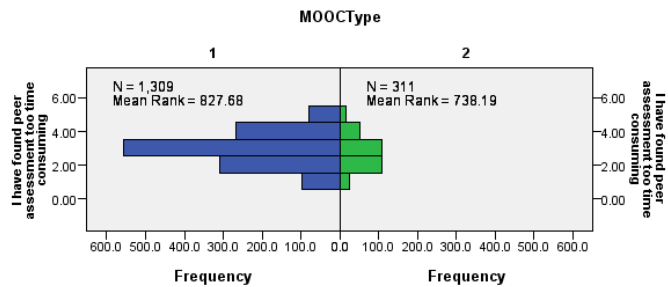
Total N	1,620
Mann-Whitney U	181,061.000
Wilcoxon W	229,577.000
Test Statistic	181,061.000
Standard Error	7,056.072
Standardized Test Statistic	-3.187
Asymptotic Sig. (2-sided test)	.001

Independent-Samples Mann-Whitney U Test

MOOCType

Total N	1,648
Mann-Whitney U	221,384.500
Wilcoxon W	273,387.500
Test Statistic	221,384.500
Standard Error	7,314.923
Standardized Test Statistic	1.080
Asymptotic Sig. (2-sided test)	.280

Independent-Samples Mann-Whitney U Test

MOOCType

Total N	1,689
Mann-Whitney U	198,000.500
Wilcoxon W	249,360.500
Test Statistic	198,000.500
Standard Error	7,587.937
Standardized Test Statistic	-2.773
Asymptotic Sig. (2-sided test)	.006

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