Scaling Classroom IT Skill Tutoring: A Case Study from India

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in

Conference on Human Factors in Computing System
(CHI-2018)

Montreal QC, Canada

Report No: IIIT/TR/2018/-1

Centre for Data Engineering
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Hyderabad - 500 032, INDIA
April 2018
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ABSTRACT
India is home to the largest under-25 demographic profile in the world, but lacks a job-ready educational system. It requires a wide-spread, skill-oriented educational model, equipping youth to thrive in highly dynamic job markets. As a response to the huge demand for technical education, a large private skill-tutoring ecosystem has sprung up in India but remains geographically limited. This paper, drawn from a three-month ethnographic research conducted in Ameerpet (arguably India’s largest IT skillling hub), probes the pedagogic style and characteristics of tutoring, and offers reasons why learners prefer to enroll into a physical model of classroom teaching over online courses. We make design suggestions for online learning platforms to attract students who are marginalized in the more formal and competitive education system, and opt for Ameerpet-like skill-hubs. Our primary offering is to suggest a shift in perspective of online education platforms to include job readiness and accompanying changes in course content and delivery.

Author Keywords
Technical Education; Ethnography; IT Skills; India; Blended Learning

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
The rapid rate of population growth in India over recent decades has resulted in the largest under-25 demographic profile in the world - 604,394,787 people (49.91% of total population) [10,39]. The combination of an inadequate education system and a turbulent international market has left many of the youth ill-suited to gain employment in technical professions, a significant marker of economic and social prosperity in India. Around 1.5 million students pass out each year with an engineering undergraduate degree [29]. Channelling the productivity of this segment of population towards economic growth requires a wide-spread, scalable, skill-oriented educational system equipping young people to survive and thrive in highly dynamic job markets. Both government and corporate bodies, recognizing the threat posed by gaps in skill education and suitability for the job market, are looking to online skilling services as a way of meeting widespread demand for job-oriented skilling. The advent of online education and blended learning as a serious alternative to formal education in the Global North points to a possible solution for India too, but online learning for the Indian consumer has thus far consisted primarily of importing courses designed in the West. A majority of Indian students face challenges deriving value out of the online courses in their current form. Moreover, a major critique of Massive Open Online Courses (MOOCs) remains their a-contextual nature and lack of student retention from sign-up to course-end [30,41].

The geographical scale of the Indian sub-continent, variation in language and cultural contexts, and diversity in the levels of student capabilities to learn and participate in the education system, present additional challenges to scale quality educational systems. However, a potential solution in the form of a massive informal skilling industry already exists in India. A number of coaching institutes have come into existence in major Indian cities, imparting skills that cater directly to the job market - the institutes being primarily a market-driven response to youth demands for job-ready skills the current education system is unable to deliver. Students join these institutes in large numbers, attracted by the short-term time commitment and clear match between their goal of attaining work and the institute's offerings. Yet, the situated nature of these institutes in specific geographic sites in India, despite enrolling thousands of students each year, remain limited in reach.
Nonetheless, the institute’s success in attracting and training students for over three decades point to a learning model worthy of serious study. The commercially driven skilling hubs can be considered as places bearing tutoring models which online learning platforms aiming to skill similar youth segments can effectively borrow and build upon. This paper examines the proliferating commercial skill-tutoring market of India as a site from which online learning initiatives can take valuable marketing and design inputs.

Our paper specifically probes three facets of our research field - the social profiles of learners flocking to Ameerpet; the preference for choosing a situated learning model over taking online courses; key pedagogic style and characteristics of teaching in the Ameerpet institutes.

Our research suggests that, aside from lack of knowledge or resource constraints, there are aspects of design, marketing and implementation of courses taught in Ameerpet that make students opt out of online learning. However, for a country as vast as India, a physically grounded site faces serious limitations in delivering and meeting demands for IT technical skill proficiency - relocating to Hyderabad is not a possibility for everyone, nor can working professionals place their current employment on hold in order to upskill. While locations like Ameerpet continue to expand, the need of the hour is melding context-specific teaching style of Ameerpet with a massively scaled dissemination platform. We argue that the creation of such a platform can benefit by taking cues from the existing successful tutoring services and translating them to an online interface. This paper is a preliminary attempt in that direction, highlighting key aspects of Ameerpet’s situated tutoring model attracting droves of job-seeking Indian youth. We offer suggestions for mapping some of these aspects on to the virtual world of learning.

LITERATURE REVIEW
An Overview of Technical Education in India
The scale and scope of technical higher education in India is significantly different from the Global North, presenting its own set of unique challenges. We briefly discuss the context of higher education in India in order to illumine the Ameerpet model of technical education, addressing gaps in the education system especially in the areas of employability and job readiness.

Higher Education and Un-employability
In 2017, there were a total of 6447 approved technical institutes, which enrolled 2,871,007 students [1]. Out of these institutions, the top government-backed institutions that are recognized in the Global North, such as the Indian Institute of Technology (IIT), make up only a small fraction of the total intake (the total number of seats offered in all Government Funded Technical Institutes (GFTIs) in 2017 was a mere 36,200) [33]. The acceptance rates at these institutions are the lowest in the world by a wide margin, with the IIT acceptance rate of 0.7% in 2014 being 8 times less than that of Ivy League institutions such as Yale and Harvard [44]. With the ‘killing’ level of competition in ‘first-tier’ institutions, many industrious and bright students turn to a variety of other institutions.

The ‘second-tier’ institutions vary widely in the manner of regulation, number of students, examination pattern, syllabus, quality of faculty, and fee structure. State universities are run by the governments of each of these states and territories of India, and cater to anywhere between 67,000-120,000 undergraduate students, distributed amongst colleges affiliated to them. All of these colleges share the same syllabus, and conduct a common entrance exam. Private universities in India are regulated by the University Grants Commission, but derive their funding from a number of bodies, funds and corporate entities, and have significantly more leeway in designing their fee structure and curriculum. Each university is free to conduct its own examination [49].

The high number of institutions, and the increasing number of students opting for technical and engineering courses, create a serious demand for quality teaching. The best teachers opt for top-ranked colleges or private institutions (which can match corporate pay packages) leaving many others without quality faculty. Most of the low-quality institutions are unable to address the diverse backgrounds of the student body - in terms of linguistic variation, level of pre-existing knowledge, previous training, within a single course structure and content. Some efforts have been made in this regard by the GFTIs in the form of English and mathematics bridge courses, but these courses rarely show any tangible benefits [34, 35]. Students we spoke to in Ameerpet, all of whom were from ‘second-tier’ institutions, alluded to the lack of out-of-class tutoring, mentorship or guidance in their institutes. As a result, students who are lagging in the first year fall further behind through the course. Uneven quality of teaching, a limited focus on practical knowledge, and lack of a participative classroom culture, creates an exam-focused atmosphere, with students focusing on memorizing material rather than developing practical knowledge of the subject [15].

A technical report places 18.4% of the total number of engineering graduates employable in general, and only 3.2% for jobs in the IT industry [31]. Large companies such as Infosys and TCS hire students from campus interviews in lesser ranked institutions and provide custom training to new hires. HCL, the fourth largest IT company in India, has gone one step ahead and started offering IT training to high-school students allowing them to bypass college education entirely [7]. These individual corporate efforts are disparate, unregulated and insufficient to deal with the volume of fresh graduates that the system churns out each year.

Since 2004, engineering education is being taken online by some of the tier one institutions we referred to earlier, the IITs and BITS, to scale quality teaching in areas bereft of quality education. Much of these efforts are a repository of recorded class room lectures that allow access to students enrolled in institutes having a prior partnership in place with the parent institution creating the repository of lectures [46].
These online resources have not been designed to engage, reward or motivate students who visit them. They exist as a resource that is available and accessible but nothing more in terms of tracking participation and improving student engagement and retention strategies. Similarly, courses for working professionals offered by the above institutes [46] that do offer updated IT and programming knowledge are expensive, with a cap on the student numbers that can enroll. The recent introduction of a high-quality Master’s Degree in certain engineering streams by Indian Institute of Technology, Hyderabad targeting job readiness in IT industries, while addressing the education-employability gap, is limited in scale. It caps and filters student enrollment based on past academic performance and charges a heavy fee [21]. Again, we see awareness but no scalable solution to manage the increasing numbers of young Indians seeking technical training for industry jobs.

Online Learning and India

India is becoming increasingly optimistic regarding the potential of online education, with CEOs of major tech companies praising the advent of MOOCs in India, partnerships between companies and major MOOC providers, and increasing enrollment in online courses [5, 26, 28, 36] There are several online learning initiatives tailored to the needs of the sub-continent, including an experimental design by MSR India, upcoming government initiatives like Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM), Skill India, and a partnership between IIT-Bombay and edX [16, 22, 32]. However, scholarly work analyzing the design and impact of specific initiatives in the Indian context remain insufficient. There has been some work quantitatively measuring the impact of MOOCs in the Global North, using data gathered from courses that were offered by MIT, Harvard, and Stanford. These studies attempt to develop frameworks of engagement styles typifying MOOC users to understand what differentiates learners who finish the course from those who quit the course early [6, 9]. More studies based on data from MOOCs originating in the Global North deal with concerns specific to low-resource and emerging markets, such as the needs of English as a Second Language (ESL) students and creating awareness around online education. These studies point to differences in the behavior of native English speakers and ESL students while interacting with the video content, particularly in the presence of additional text material, and argue for more modifiable, customizable MOOC platform designs and tools, based on the language of the user [13, 47, 48]. A study from the University of Washington focused on students from lesser-developed regions shows, unlike their counterparts in developed regions, users from low- and middle-income populations tended to have basic ICT skills, and considered certification as a major motivation in completing courses [4]. These results are promising indicators of MOOC adoption in a low-income context like India with high demand for job ready skills. The study also co-relates the significance of context and learner-backgrounds in MOOC usage and adoption, with specific linkages to linguistic and income differences. A direct transfer of educational content and online platforms from developed country contexts may not be the most successful of strategies for imparting the required education and skills to people in developing countries.

Despite the recognition that many MOOC users come from non-English speaking countries [4, 12, 17, 20], the studies discussed above continue to develop content for an English-speaking audience and their specific education contexts. There has been little enquiry exploring online education initiatives specific to developing regions. A few papers provide a general overview of the expansion trajectory of MOOCs, but do not delve into the varied contexts or geographical locations that MOOCs are poised to enter, nor the design challenges these contexts hold [8, 21, 37]. Design proposals for MOOCs catering to the Global South, specifically from a faculty member at IIT-B, envisions the use of learning platforms on mobile phones, and blending the MOOC model with situated learning, combining lectures, exams and evaluation methods with online learning tools [24, 27, 38]. The limitation of this conception of blended learning is the emphasis on college-going students as primary recipients, who are incentivized via grades and kept in check by physically present professors and course obligations.

An in-depth research engagement with designing online learning initiatives in India comes from several research papers by MSR India. One report highlights factors disengaging MOOCs in India, namely the speed of online videos, language/accent, bandwidth constraints, and the lack of support from educational institutions [14,15]. An experimental setup, based on this report, is deployed to demonstrate a small but marked improvement in learning outcomes with blended learning aids [15, 19]. A conference on MOOCs for Development pointed out the untapped opportunities for MOOCs in developing countries that can address learning inequalities, if only they are able to overcome design challenges for large-scale deployment. These challenges are similar to those highlighted by the MSR study - limitations of digital access, lack of cultural relevance in content and delivery, and lack of accreditation [14,15,11].

To sum up, while there are demonstrated gains from MOOCs deployed in developing nations, evidence suggests that several challenges can be addressed through a more informed design.

Our attempt in this paper is to introduce learnings from a successful, large-scale and situated model of IT skill-tutoring, and suggestions to overcome design challenges for MOOC-like platforms. Anthropological literature predicates the arrival of new products in any domain incorporating a wide range of elements borrowed from existing practices, models, and systems, and allowing users to adapt quickly and successfully [50]. We use our study to stake a claim that an existing educational model, a grounded and commercially successful one, is currently managing challenges similar to
those faced by any educational system aiming to operate at scale. Could this existing model offer design insights for MOOCs? Grounded and situated learning models from India have thus far not been used as a resource from which to draw design lessons for online and blended learning models. Our research, through immersive fieldwork about one such existing tutoring model, seeks a detailed understanding of the cultural context in which the tutoring service system survives, the demands made on this system by students, and the ways in which the system thrives by fulfilling these demands. Our study provides a set of powerful initial design suggestions, with a hope the Human-Computer Interaction (HCI) community will build upon in the future.

Apart from a few newspaper articles [3,43], it was difficult to find rigorous research work examining IT skill-tutoring hubs and institutions in India, especially their pedagogical structures. Analyzing the success of physically situated, classroom-based education models for IT skill-tutoring, and their translation to online platforms, is an attempt thus far made only in our paper.

METHODOLOGY
This paper is informed by primary data collected from a variety of qualitative methods. Since June 2017, we have been conducting fieldwork in Ameerpet, a dense bustling commercial suburb of Hyderabad city, and the largest IT skill-tutoring hub in India, largely run by the private sector, offering a plethora of courses ranging from robotic process automation to manual testing courses. All three authors have been visiting Ameerpet for a firsthand experience of its social geography, and to conduct interviews with students, tutors, and managers of IT skill-training institutes. The first author of this paper enrolled in a course for 6 weeks for an ethnographic immersion and partaking of classroom pedagogy. The second author undertook a variety of demo lessons for several IT skill-learning courses, to get a contextual feel for the quality of teaching, tutors, class infrastructure, and student interactions. The third author provided the analytical scaffolding to shape field data, and developed the contours of this paper. All three authors participated in a total of 26 interviews with the students [11 male, 15 females], 5 tutors, and 11 managers of institutes. All names have been changed for the purpose of anonymity.

The first author enrolled into a course called ‘Testing Tools’, offering an understanding of manual and automation testing methods. Testing forms a significant part of the Indian IT industry, and many of our preliminary interviews pointed out students, particularly those with inadequate technical skills, considered the ‘testing’ job profile as an easy entryway into the IT industry. Tutors and managers informed us that ‘Testing Tools’ is a popular course in Ameerpet, and students rolling into these courses allegedly consider themselves below average in the domain of computer science. Classes spanned two hours, with automation testing taught in the first hour, and manual testing in the second. Manual testing was offered for free whereas automation testing had a fee of Rs. 4000 [ 70 $US]. There was one instructor handling both streams, a man in his early 30s, who owned a company that provided testing services to clients. Class size varied from day to day, but on average 80 students would come for the class with a 55:45 male to female ratio. Very little conversation was possible during class, and the majority of time was spent observing pedagogic techniques and nonverbal student reactions. In the short ten-minute break during the two sessions and after class, the author spent time querying students about their backgrounds, thoughts on the lecture, classroom highlights and drawbacks, and reasons for not exploring online options.

These face-to-face, depth interviews helped understand the importance and value of the Ameerpet institutes for students, the quality of tutoring, and relevance of the syllabi. We developed social profiles of students and tutors to comprehend the motivations to study or teach at Ameerpet. Our depth of immersion and interactions with key stakeholders in the Ameerpet tutoring system offered points-of-view to evaluate the offerings and implications of its ecosystem. Importantly, we made an index of the technology infrastructure, computers, software, and peripheral devices servicing the IT skill training in classrooms. All our interviews were recorded, transcribed, and coded manually to analyze our research questions. More importantly, handwritten notes from field and classroom observations of tutoring and pedagogic styles of teaching, student response, and classroom participation contributed significantly in the coding and analysis of data.

Choice of Field Site
A response to the demand for basic and advanced IT skills in India can be found in the form of skill-tutoring classes,
The marketing and course structure of these classes identifies and targets employability as the key goal of students enrolled in their classes, offering a clear link between the skills they learn and the job market they are preparing to enter.

Ameerpet, our chosen field site, is a dense bustling commercial suburb of Hyderabad city, and the largest IT skill-tutoring hub in India catering to students and IT professionals alike. The hub harbors thousands of skilling centers, along with peripheral infrastructure amenities such as hostels, note-selling outfits, and food and beverage services. Estimates vary about the number of students taking these courses, but peg the number of incoming students at anywhere between 60,000-100,000 students per month [3,35]. Each institution offers multiple courses ranging from MS Office to Robotic Process Automation, along with placement aids, with fees for the same course varying across institutes, from Rs. 2,000 to as much as Rs. 35,000 for a single course [30$US to 550$US]. The turnover time for these institutions is rapid - courses last from one to six months and multiple batches for the same course are held in quick succession. The managers of Ameerpet institutes update courses to tally with skills in the job market, mining information from online job portals and their own industry contacts to keep track of the latest demand for jobs. Despite the frequent establishment of new institutions, often by tutors from older ones, there is very little undercutting of competition, with enough market demand for the staggering variety of offerings. Students are often encouraged to attend free demo sessions before making any payments and are not pressured to immediately sign up for courses.

**FINDINGS**

In this section, we lay out key findings from our ethnographic and interview data about the salient features that make Ameerpet a success. First, we outline the profiles of students who come to Ameerpet to show similarities with the student segments that MOOCs target, and reasons for the lack of student interest in using MOOCs. Then, we move to the functioning of the Ameerpet model, and factors that make it a success. Our findings are organized along three central questions - how do people discover Ameerpet; what are the motivations for persisting with Ameerpet; how do institutions cater to meet expectations through pedagogical tools and by tailoring an accessible ecosystem even for out-of-town learners.

**Students of Ameerpet**

Ameerpet draws students from all corners of India, who move to Hyderabad city specifically to enroll in a variety of courses. Their primary motivation being securing a job, or getting a raise in an existing position by attaining new skills. During the course of our fieldwork we encountered students from neighboring districts in Telangana to neighboring states like Andhra Pradesh and Orissa to the far-flung Northeast states like Manipur. International students, particularly from South-East Asian countries, are also present in small numbers. The students usually have graduate degrees in different streams, most without work experience; student composition in a course depends both on the course offered and class tim-

-ings. For example, a course which requires prior coding knowledge contains students with a background in computer software engineering [CSE], whereas courses marketed as 'non-technical’ are more likely to draw students with an arts and commerce backgrounds, as well as non-CSE engineers. Courses that are conducted on weekdays attract non-working students, whereas employed learners flock to weekend courses. Despite varied educational backgrounds, none of these learners have studied in the top tier colleges of India - most have degrees from unranked private colleges and state universities located closer to their homes.

Students who come from near and far take residence in the many hostels surrounding these coaching centers, which have dorm-like setups of multiple bunk beds in a single room. Rent varies from Rs. 3,400 to Rs. 10,200 [50$US to 100$US] per month, depending on the quality and congestion of the room; considering other expenses students pay on average anywhere between Rs. 7,000 to Rs. 15,000 [80$US to 140$US] per month to stay in Ameerpet. All of the students we encountered possessed smartphones and had access to social network and messaging apps such as Facebook and WhatsApp. Laptop access was not as common - while the majority claimed to have family laptops or desktops, very few brought them to class (due to permissions of family members and fear of damage/loss). Many of them used either devices to browse job portals, such as [monster.com and naukri.com]. They are also acquainted with (and/or have bandwidth for) audio/video content websites (including YouTube) and several other content-downloading sites. Internet activity patterns of students indicate that low bandwidth or inability to navigate browsers is not a hindrance to accessing online educational platforms. Indeed, the majority of our respondents had tried to familiarize themselves with online tutorial videos, and a small minority continued to use them as a supplementary aid. However, they did not consider using them as a primary educational tool due to the following reasons:

- **Language and accent barriers**
- **Finding default speed of videos too fast**
- **Contextual examples they couldn’t relate to**
- **Inability to find ‘relevant’ courses**

Specific skills taught in Ameerpet such as Java or Python are easily available online, yet have no use to its students. They choose to come to Ameerpet to learn the same skills which are primarily oriented towards teaching a focused set of content, one that is relevant for a specific job profile. The language of jobs and job titles are those that captivate students, and help them seek out courses that can align with a potentially active job profile. Students aim and aspire for specific job profiles, and seek to enroll in course offering
specific skills related to those profiles. While students gain as they progress in a course, and are aware of the need for multi-skilling, they prefer to take courses that are clearly tailored for a job profile instead of courses geared towards a generic skill-set.

Some online learning platforms have recently begun to offer course bundles that cater to a more targeted and focused learning objective - these bundles are commonly referred to as nano-degrees or micro-master’s programs [43]. There are several problems from the point-of-view of students enrolled in Ameerpet: programs offered in the nano-degrees and micro-master’s program are of an intermediate to high difficulty level. In the opinion of these students, very few courses cater to the skills required for a basic IT job in India; courses are both long (anywhere between 6 months to two years) and expensive (to the extent that many students coming to Ameerpet cannot afford to pay a lump sum amount); the navigational interface and terms of description used - such as ‘audit’, ‘nano-degree’ - are too complex for the average Ameerpet student. Amar, a fresh graduate taking a DevOps course, said of his experience with online courses ‘There are so many buttons [tabs], I can’t figure out where to go.’

To make visible connections between the social profiles and IT knowledge/skill proficiency of students, we attempt to classify the Ameerpet learners into three ideal types A, B, and C. Type A learners are of a higher economic class, with personal computers and greater access to resources, technologically adept, and use online videos as learning supplements. They are able to search and supplement relevant content online, are willing to take initiatives to tweak online course settings, skip to relevant sections and ignore parts they find to be irrelevant. Such learners are in the minority in Ameerpet. Type B learners also possess technological capabilities, but to a lesser degree - they have limited personal access to computers, but are comfortable with browsing the web and passively consuming content. They require content that is customized to their learning requirements, allowing them a certain pace and engagement to complete the course material. Type B learners have watched online learning videos, but commonly report the problems listed in the earlier paragraph. Type B learners are in the majority in Ameerpet, constituting 85 percent of our respondents and an ideal target market for MOOCs. Type C learners possess little to no technological capabilities, or access to computers outside class. These learners are uncomfortable exploring the internet even for basic queries, and do not watch online learning videos. Type C learners are possibly not viable targets without extensive offline interventions, but also fall in a minority in Ameerpet.

The study of student social profiles, across linguistic, geographical, socio-economic and educational backgrounds, suggest that Ameerpet institutions cater to the kind of student diversity that platforms like MOOCs need to include in order to scale in a country like India.

Finding Ameerpet: Informal Networks and Flows

Though hundreds of Ameerpet institutes have websites, there is no aggressive marketing through social media; the stand out marketing technique are the prominent banner-ads attached to the institute’s physical entrance. A question we asked every student was how they ‘discovered’ Ameerpet, sought out specific institutions and tutors. We noticed through these enquiries a robust information network that guide students to Ameerpet. Anthropological literature alerts us to the significance of informal networks in low-resource and developing economies. In these spaces, it becomes crucial to understand and tap into informal networks in order to disseminate information and product pitch [18]. As Anita, 22, a student from the state of Madhya Pradesh in Central India doing a Quality Testing course, told us, ‘my senior in college who came here after doing IT job for one year told me about this place. She said that it will help in getting skills to land a job’. A good number of students we spoke to had similar stories of friends, colleagues and family members (who have themselves taken courses in the hub and landed in IT industry jobs) directing them towards Ameerpet. Deepak, male, 21, another student in the same course from the relatively nearby city of Visakhapatnam, told us, ‘my elder brother got a job from here only. Everyone knows about this place, it is the best coaching center’. This reputation of Ameerpet being the ‘best coaching center’ is fortified in the way information circulates through students who have benefitted and found jobs - many do not even attempt to probe alternative options such as exploring local institutes or online classes before settling for Ameerpet.

None of the students we spoke to had ‘casually’ stumbled upon Ameerpet - even those living in Hyderabad chose to come to Ameerpet over other coaching institutes because of its acquired reputation amongst student’s trusted circles. Once inside the Ameerpet hub, there are several distinct ways in which students select courses:

- Stick to earlier advice from social networks, which often specified the institution or instructor to seek out
- Attend several demo sessions and decide based on:
  - Class size
  - Classroom conditions
  - Teaching method of instructor
  - Industry connections of instructor
  - Fees and freebies offered
- Speak to counsellors/receptionists at the institutions to get a better understanding of which course would suit their present skills and requirements. This was often supplemented by demo sessions.

Thus, we see the importance of networks of trust in the commercial success of Ameerpet, even as this trust is mediated by individual choices and freedom once students begin to immerse into the tutoring hub. These networks of trust are formulated and fortified in the following ways:
• **References from immediate social networks:** References rely on existing trust in the social relations that recommend Ameerpet institutes. Further, social relations among students from similar socio-economic standing with similar demands bolster faith in the selection criteria offered by these networks.

• **Reputation of tutors:** Tutors are often employed in the IT industry, which assures students of the authenticity of information imparted.

• **Success stories of Ameerpet:** Placement records of institutions, as well as anecdotal evidence of people who have found jobs after Ameerpet.

• **Demo sessions:** Demo sessions offered by all institutes give students a sense of transparency and choice, which reinforces the reputation of Ameerpet as an educational hub as opposed to a profit-driven market.

**Repetition, Repetition, Repetition: Pedagogical Tools**

In this section, we discuss the pedagogical tools and techniques employed by the Ameerpet instructors and student responses to them. Much of this section is informed by immersive ethnography of a six-week course by the first author. Instructors manage an intellectually broad spectrum of students and use pedagogical tools to keep them engaged, reach out to the bottom segment, and procure immediate feedback about student level of retention. They keep in mind the student’s goal of job-attainment and optimize course material to this end. We outline key pedagogic techniques adopted by tutors below:

1. **Repetition.** The most significant technique used in class is constant repetition of course material. The instructor gives a broad overview of course topics, then moves to explaining specific concepts. Once a concept is explained, the instructor repeats the definition several times, emphasizing key words. After the first two or three passes, this is combined with engagement techniques discussed below.

2. **Engagement and Examples.** Despite large class sizes, there is considerable effort by the instructor to maintain a high level of student interaction. The primary techniques of interaction include:

   - Asking students to repeat after him
   - Questions (easy multiple choice, fill-in-the-blanks, single line answer types) addressed to the entire class
   - Questions addressed to individual students or sections of students (boys vs girls, for instance).

The questions are kept purposefully simple to help students revise content being taught and gain confidence in that knowledge. Despite these tactics, some students take three or four rounds of questions to grasp key concepts, due to unfamiliarity with the language of instruction and the course material. Context-specific examples are often used in order to make course material more intelligible to students. At times, examples pertain directly to the material being taught. For instance, the instructor may explain organisational hierarchies in an IT firm by referencing classroom setting. At other times, the instructor draws analogies to help students understand a concept from life around them, or specific technologies popular at the time. An example in the use of an action sequence in ‘Robot’ a block buster in South India, to explain regression testing. The later involves the execution of routine tasks by new modes of software to fins anomalies in the behavior of product under the testing cycle. In the movie sequence a large number of robots are instructed to perform a physical task and the human disguised as a robot is singled out. The instructor draws a popular parallel to explain a technical concept to students newly minted in IT pedagogy. The goal of this engagement seems to be geared towards helping students contextualize educational material for better retention, and in preparation for in-person job interviews. Student responses in class help instructors gauge in real-time the degree of comprehension about a topic being taught in. However, this feedback tactic may not always indicate an accurate measure of student progress, as some of them stop responding out of boredom.

3. **Verbal and Visual Cues.** The style, accent, and flow of the English language adopted by the instructor, despite sharing a reasonable level of socio-linguistic conventions with his/her students, still prove difficult for the class to grasp. Unable to switch to a local language to deliver the course in the class room, tutors rely heavily on voice modulation techniques, non-verbal cues, and visual demonstration aids, in order to explain material. Verbal and visual cues are combined with the two techniques mentioned above as a means of guiding students. Since instructors don’t expect instant intelligibility of course material by students, they combine a series of prompts and querying techniques into their teaching styles consistently prodding students towards correct answers. Verbal cues include voice modulation to emphasize the correct answer, while visual cues can range from pointing out the answer on the black board to changing body language. In this way, classroom questioning does not necessarily serve to test students on their knowledge, but function as a proxy form of learning and revision.

4. **Dictation of Notes.** Since there are no textbooks or reference materials provided by the institute, notes taken in class are a critical tool for self-study. The instructor sets aside a portion of class for dictating notes - note-taking is serious work in an Ameerpet class room, with students often using different colored markers to organize written notes. The instructor was often heard saying ‘don’t write while listening, you
won’t write clearly, I’ll tell you later... notes are very important, everything should be easy to understand and neat so you can revise easily’. Outside of class, these notes stand-in as the only study material. Students are often seen sitting in empty class rooms, before and after instruction, studying from their notes.

5. **Detailed Demonstrations.** There is reliance on using projectors in order to show documentation templates, code excerpts, as well as guide students through the installation processes for software tools. When a new software is being introduced, the instructor takes nearly an entire lecture to walk students through the installation steps - from a demonstration in using Google search to find the installation link, to familiarizing them with the product. In addition, the tutor uploads step-by-step instructions with screenshots onto his website that students are encouraged to consult in case of doubt.

There is a strong, but mixed student response to one technique in particular - repetition. Often during a lecture, students would sigh and titter impatiently as the instructor repeated instruction material. Outside of class, they remarked about it several times, wishing they had some way to skip over the repetition. Manju, a 24-year-old student from Orissa who had worked for a year in HR, often said, ‘How much will he repeat? I feel like I am in nursery.’ However, other students argued for the repetition and querying pedagogy helping in the understanding of theoretical concepts. Manju and Vishali often clashed on this point, with Vishali saying, ‘that’s why I can understand things! He explains so well, going slowly and repeating’. Other students sitting around us would join in, siding with Vishali. These were students who found most online videos too fast, and hadn’t considered using speed toggles such as pause, rewind, play at greater or slower speeds. Priya, a 22-year-old engineering graduate also from Orissa, said, ‘I tried to see online videos, but so fast it was [sic]. This is much better, I can understand what sir says.’

![Figure 2. A banner announcing successful job placements outside a coaching institute.](image)

Several students also took issue with the mode of demonstrating software installation and use. They failed to see the point of being given this demonstration, without being able to simultaneously install the software too. All of them agreed that the demo was necessary - they weren’t able to independently search, navigate and install the software - but would have preferred if they could install the software in real time, with the added provision of Wi-Fi access in class. Several of them who could successfully install software on their devices did so with the aid of YouTube help videos.

**Job-Oriented Outlook**

In this section, we highlight job-attainment as a central goal among students who enroll in Ameerpet, and describe strategies adopted by institutions to align their course offerings with this goal. Every student we spoke to [without exception] listed landing jobs in the IT industry as their top priority for enrolling in an Ameerpet institute. Many of them weren’t concerned with the job profile, or even the salary. In a discussion amongst several students regarding placements and prospective salaries, Vishali said, ‘...What’s the problem in starting from zero? We can start from the base, get experience then move ahead’ - to which her friends heartily agreed. In another discussion, Prakash, male, early 20’s, a fresh graduate taking a SAP course, echoed this statement, ‘I want to get a job in IT sector… I don’t care about the salary. Growth and money will come later, once the job is there’. Students hear and believe that stable jobs in the IT industry, along with opportunities to go abroad, are definitional as career prospects. The positions they target depended on their initial skill level - many were content being non-technical workers as long as it was in the IT segment. Students use Indian job portals such as Naukri.com to hunt for employment, while dipping into personal networks. Ameerpet Institutions, keenly aware of this demand, adopt several strategies to ensure course offerings align with skills required in the IT market, and alert students of this alignment.

Managers browse job portals to clue into current trends. Sankar, a co-director at a 15-year-old institute, said that he spent several hours a week trying to figure out the current in-demand courses, by looking at job portals. As Mr. Raman, a manager at a recently opened institute, explained to us, ‘If a student comes and says they have seen a course in job website, and I don’t have that course, then students will not come to me. Even if that course is not right for them and later I make them take another course, first I need to have the latest course on offer’.

Instructors are a key industry link - a majority of them are employed IT professionals who moonlight as tutors in Ameerpet. They have insider knowledge of job profiles and skills in demand; the kind of skills and knowledge needed to learn tools; and modes of classroom instructional delivery of a course material for students to fare well in job interviews. For instance, instructors stress on the difference between 'course knowledge' and 'job interview proficiency' – tutors highlight sections of coursework that are important for...
interviews, and train students to answer basic yet critical interview questions. Tutors decide course syllabus, and could choose to cut on redundant software tools in favor of new industry standards. In the Testing course undertaken by the first author, the instructor explained he wouldn’t be teaching a tool called QTP since it was no longer valuable in the job market (despite being listed in the syllabus), and would instead focus on ‘Selenium’, an open-source testing software platform, which was, in the instructor’s words, the ‘current rage in learning testing tools’.

Institutions offered additional services to students enhancing job prospects:
1. Resume and CV templates which students can download and fill.
2. Links to job portals and e-mail forwards of possible opportunities
3. Provision of certificate of completion of course.
4. Provision of off-site work training, when the tutor or manager of an institute are also senior-level employees in the IT sector that is willing to outsource work.

The structure of off-site work in Ameerpet involves setting up a work environment, complete with desktops, employee ID cards, and biometric swiping, all within the precincts of the coaching hub. Students immerse themselves in this work universe, often a hierarchy of team leads, project managers, and clients, much like in the regular world of IT employment. These are generally short-term unpaid stints, anywhere between 15 days and a month, that periodically convert to an employment opportunity. Institutions prominently advertise job placement aid as one of their unique selling points, both on banners adorning the entrance to the institute and during counselling sessions.

DISCUSSION

In this section, we analyze our findings to offer suggestions for how learning models at Ameerpet can be translated to re-model online learning environments for improved engagement and relevance. This requires a good insight into the specificities of the Ameerpet learning model: how the tutoring hub develops a strong understanding of the cultural contexts of students (the how-and-why of students flocking to the hub, and what are they looking for); in tweaking the course content and pedagogic style to match student learning capacities; in revising the syllabus to reflect current market and job readiness. The translation of these features into the structure of an online or blended learning environment requires rethinking platforms from the ground up; from marketing these courses to platform user-interface and a relevant course/syllabus oriented towards student goals.

Pedagogy and Course Delivery

We would like to draw attention to the ideal types created out of our Ameerpet student profiles from the findings section. Our student profiling showed challenges pertaining to content delivery of a video lecture, like the speed of the video and the formats of engagement with the video, were exacerbated in the case of type B students, who are less comfortable engaging with technology and modifying settings. Online educational platforms understand their user baseline to be students who fall in the type A category - we suggest a reverse approach might be more helpful. Learning aids that favor slower type B students need to be set as the default, with toggle settings accessible for type A students who can manipulate video settings to suit a faster learning pace.

Thus, the following learning tools require incorporation as the default settings of educational videos - repetition of course material by the instructor, multiple rounds of revision, more frequent querying beginning with simple questions. Additional aids, such as auxiliary study material available online, need to be included in the videos to alert and notify learners. Type A students can navigate around these videos to speed up or increase difficulty as required.

Another significant barrier, outlined in our literature review, in platforms like MOOCs in engaging learners was language and accent. Online courses have unsuccessfully dealt with language barriers by using text-based methods - such as captions. Instructors in Ameerpet overcome linguistic barriers using intonation and gestures, which act as cues for online course instruction. The use of projectors and screenshots of relevant material in the Ameerpet class room can be easily replicated and translated for online platforms. The more difficult repetition is the use of context-specific gestures and voice modulations students of Ameerpet are familiar with. Re-configuring these context cues for online instructional resources will be an interesting challenge for developing instructional video technologies in MOOC like platforms.

Syllabus and Relevance to Context

As highlighted in our literature review, MOOCs struggle to provide content that is relevant for its vast base of learners. Our fieldwork in Ameerpet identified job-readiness and employability as key concerns of students. We have also shown these students finding online courses irrelevant for primarily training learners in a skill that may not lead to an employable job profile in India - while the same students are alert to the alignment of a course to a job profile for which they clearly see a value in a job market. We suggest the following as targeted and relevant design changes:

- **Identifying Industry Demand:** Institutions in Ameerpet manually scan job portals, and use industry connections in order to identify the latest tools and trends of the IT industry. Online platforms can refine this process significantly with data mining tools, to match what technical and soft skills recruiters are looking for in any given time and geographical setting.
- **End-to-End Project Oriented Courses:** Courses focusing on teaching the entire skill set required for entry level work in a particular job profile or stream. For example, the Testing Tools course in Ameerpet
begins with an overview of software engineering and development; moves to teaching the part of Java programming required for testers; then on to the use of various automation software; finally, students create and execute test cases as they would in a workplace. Similarly, an Android development course that lasts for two months begins with software installation, moves to coding in Java and then an overview of various APIs and their implementation in a software application. It is the packaging of an end-to-end learning and tutoring course structure that wins the day for the Ameerpet tutoring institute.

Platform Design and Addition Offerings
Designing platforms hosting online courses is as critical as designing the course content and its progression in a video. The iconography, navigational menus, filtering options and tabs of online platforms presented a hurdle for students, preventing them from finding and using desired content. More work needs to be done in understanding the preferred mode of interaction of Ameerpet students with electronic gadgets. Clearly, they are able to navigate social media platforms and content-sharing sites. Yet, the interface of online courses with its many navigational menus, filtering options and tabs, proves to be a challenge. Since our fieldwork focused and derived data on classroom teaching, we do not comment on the nuances of designing platform that students will be able to interact with more comfort. Second, the platform, course content, and delivery, form an ecosystem which needs to be optimized to student requirements. Institutions in Ameerpet offer a range of services, specifically geared towards employability, thus enabling the course package to attract students. Most of these aids are easily and individually available online, but not included in online courses, as part of the websites or links to external pages. Fresh graduates, who make up the bulk of student population, are new to the art of job application procedures. The following suggestions can be incorporated into online ecosystems:

- Prominent section for interview aids such as CV templates, mock questions
- Links to job portals and options for email alerts
- Automated career maps in which students can input their skills, goals and discover course combinations that help achieve desired targets
- A detailed form of certification that highlights work done during the course - including assignments, short and long-term projects and an assessment of student performance.

Marketing and Awareness
Marketing of online courses can take some cues from Ameerpet. Social networks, a key driver of Ameerpet, will be initially difficult to tap into. However, there are other strategies that can be employed, namely:

- Advertise Convenience as a USP: The ability to pick, choose, sample courses free of cost, in the comfort of locations of their choice. A sound market strategy needs to push the above features as unique to online learning resources, while simultaneously identifying and targeting the priorities and cultural contexts [such as language, technical proficiency] of these students.

- Success Stories: As with Ameerpet, online platforms can highlight their instructor profile, offer industry connections, and relate success stories of students using online platforms to get jobs. The narrative needs to dwell on and build upon the desires and aspirations of students, as they turn to and invest in tutoring service, in order to form a meaningful connection

- Use Familiar Online Spaces: While advertising cannot directly reach into the informal people-based networks, they can begin to target online spaces students are concentrated in, particularly the social media apps currently in use.

- Tie-ups with Job Portals: Job-portals particularly present ripe opportunities for pitching courses - each job posting contains a set of requisite skills that can be matched with online course offerings. Making explicit this link between the course, skill, and job prospects and offerings to the student-learner is an important step towards the adoption of an online course. Marketing of courses need information packaging, to address the ability of students to derive relevance of online education for work, and its advantages for creating job opportunities that resonate with their ambitions

CONCLUSION
Through a rich immersive ethnographic study, we attempted to offer learnings that sustain a large, physically located technical skill tutoring hub in Hyderabad, India. Our intent is to tease out implications that suggest a student preference for physical classroom situations to online MOOC-like learning resources to acquire job-oriented IT skill-tutoring; and kneck these implications to offer design suggestions for online learning platforms that aim to target millions of students in India. We make design suggestions for online learning platforms to attract students who are marginalized in the more formal and competitive education system, and opt for Ameerpet-like skill-hubs. Our primary offering is to suggest a shift in perspective of online education platforms, to include job readiness and accompanying changes in course content and delivery, and point out directions for further work.

ACKNOWLEDGEMENTS
We are grateful to IIIT Hyderabad for financial and intellectual support; We thank Pardhu Pinnamshetty, Alisha Abraham, Soumyajit Ray, and Pranuthi Vedulla for ethnographic support.

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