Personalised learning is the way: Interview with Mo Sultan and Vamsi Yerramsetty

Talking educational inequality, psychometrics and founding a startup while at university with the team behind Edicat Learning.

Maddyness is collaborating with _YSYS_, which connects diverse people with opportunities in business and tech. We've spoken to three alumni from its FoundersDoor incubator programme about how they started their businesses, and the challenges and triumphs they've experienced along the way. First up: Mo Sultan and Vamsi Yerramsetty, founders of Edicat Learning.

Tell us what Edicat Learning does and how it came about in your own words. Did you have expertise and experience in the field you chose?

Edicat Learning is an advanced psychometrics enabled learning platform that designs personalised learning plans for mathematics students. These address their individual knowledge gaps, across the national curriculum learning outcome standards.

Our social enterprise leverages the latest research in cognitive diagnostic modelling and machine learning to personalise learning for students.

These assessments intelligently select questions based on a variety of inputs such as question difficulty, time taken, and prerequisite concepts required in order to pinpoint the student's underlying misconceptions. Thereafter, the platform provides parents, teachers, and students with real-time performance reports across granular national curriculum learning outcomes, as well as their predicted grade.

With an understanding of why the student is underperforming, they receive personalised study plans that focus on the concepts they need to work on, starting from the most fundamental prerequisites, to maximise their performance. Our platform also provides teachers with a detailed understanding of each student's individual learning needs and empowers them to pivot their classroom learning to ensure effective remediation and achievement of target grades.

Our team has over 6,000 hours of experience teaching K-12 Mathematics students and over 7 years of tri-sector experience in education. This includes strategic advisory for implementation of adaptive assessments in high-stakes recruitment exams, and liaising with the Ministry of Education (India) to support the development of the first education-based Unified Digital System.

With a PhD and a Business Management degree from Imperial College Business School, our founding team amalgamates the rigour of academia with the agility of an enterprise to bring this disruptive technology to the classroom.

Having taught in schools, charities and one-to-one sessions, we have seen the significant impact that personalised learning can have on student performance. It's incredibly rewarding to understand how they are reasoning about Maths problems and identifying the knowledge gaps that are holding them back from achieving their potential.

We were disheartened that, with all the impact that personalised learning promises, it is not accessible to the majority of children. At £900-1000 annually, 32% of advantaged students receive one-to-one tuition in the UK compared to only 7% of disadvantaged students. By the end of secondary school, this leads to a 19.3 month lag in learning for disadvantaged students.

To make matters worse, the COVID-19 pandemic has further worsened educational inequality where over 2 million students received less than an hour of schoolwork a day throughout lockdown.

As passionate educators, we are driven to end this perpetual cycle of being unable to access high-quality education, attaining lower skilled work as a result and then being unable to afford high-quality education for their children. We founded Edicat Learning with a mission to enable access to high-quality, personalised learning for all students, irrespective of socio-economic background.

What was it like founding a startup while at university?

Working in a startup can be challenging. It is fast-paced and is a dynamic work environment, where one must wear multiple hats. You could be liaising with your product team to design robust back-end architecture on one day and developing your business' marketing strategy and pricing models on the next.

The hours are long, the work is intense, and the stakes are high.

To effectively balance the responsibilities at startup and at the university, nuanced planning is key. This can be managed by setting up task management structures to ensure every task is diligently performed and executed in a timely manner. The planning needs to be reviewed every so often to ensure whether the tasks were prioritised appropriately as well as what systems could have been put into place to either increase output or save time.

Our results-driven mindset is reflected in the culture of the organisation. Most importantly, we have a deep, enduring understanding for one another's needs and we are keen to support each other wherever possible.

Another key aspect to cherish for founding a startup while at university is the abundance of key professional learnings, that otherwise one would not have access to at an early age. Our team is composed of members from different occupational and cultural backgrounds, which is a great ecosystem to learn from.

Finally, working at a startup also helped us hone our communication and writing skills. We are routinely presenting our ideas in front of a varied audience such as accelerators, corporates (as part of their CSR initiatives) or academic faculty. This culminated in us securing grant funding from QMUL Build It Award and getting selected as one of the top 25 teams to the Samsung Solve For Tomorrow competition.

How does Edicat differ from other online learning platforms? Tell us about the role AI plays.

We are very excited and optimistic about the future of learning with all the developments taking place in EdTech. We've seen many great companies, doing fantastic work to help students learn better.

The unique value that we bring to the market is the detail and sophistication with which we personalise learning for students. By leveraging the latest advancements in psychometrics and machine learning, our adaptive assessments take many data points to inform the questions that students are asked. This increases the information from a student response by _an estimated order of magnitude_ higher than static assessments typically used by online learning platforms. This allows us to provide powerful insights to students about their ability across granular, national curriculum learning outcomes.

For example, if a student were to receive feedback on our platform, rather than simply being told that they need to work on algebra, we specify that they have a misconception in simplifying algebraic fractions and that they need to start by learning about how to collect like terms before they can start addressing it.

Furthermore, our assessments are intelligently designed to understand why students answer questions incorrectly, allowing us to identify their fundamental misconceptions and design personalised learning path to effectively address them early on.

Will you be working with schools, individuals or both?

Our primary target market is the K-12 education sector and target segments are parents, schools and private tuition providers, where students are the main users.

In the short-term (0-2 years), our beachhead market is parents of 2.1 million GCSE students.

We have received considerable demand from parents for our platform and we are excited to have the opportunity to support them.

We will be offering intuitive learning analytics and dashboards so that parents stay informed about how their child is progressing.

Next, we will trial our platform with schools who have expressed interest in using our platform. Once onboarded, we will work with further socially deprived schools which are most in need of our product to ameliorate the significant impact COVID-19 has had on student performance.

Furthermore, since the platform automatically marks questions, it saves teachers *an average of 6.1 hours per week*, thus freeing their time to do what they do best – actual teaching. For schools, we'll be offering teachers advanced analytics at both a classroom and student level to empower them to personalise the teaching to their class' needs. We are looking to work with tuition centres in London, where 7/10 students routinely attend private tuition.

How has COVID affected the edtech landscape and your business more specifically?

COVID-19 has had a disastrous impact on student learning.

Many students, particularly those from a low socio-economic background, have not been adequately supported during the transition to online learning.

There is a large disparity in how education was delivered to different demographics, with 71% of state school children receiving no or less than one daily online lesson, while 31% of private schools provided four or more live online lessons daily.

Furthermore, most homework that they were provided consisted of assignments, worksheets and videos, as opposed to actual teaching. _Over two million children_ did no schoolwork at home or less than an hour a day.

The need to develop more effective ways of delivering education remotely has caused a sharp spike in demand for edtech products. Their adoption during the pandemic is likely to continue in a post-COVID world where schools are more open to incorporating technology in their classrooms to enhance the way teaching is delivered.

One of the major consequences of the pandemic has been that fundamental learning gaps have accumulated, which if not identified and addressed quickly will lead to a compounding effect over time resulting in students substantially underperforming below their expected mastery.

Our platform is uniquely positioned to resolve this issue, as it is able to intelligently identify these fundamental learning gaps and recommend a personalised path that students and teachers can use to address them.

Tell us about your experience on the FoundersDoor programme and how YSYS has helped you.

Being part of YSYS opened us to a community of entrepreneurs, all of whom are working diligently to achieve their missions. Sharing our story and our strategy for achieving it with others has enabled us to consider important elements in how we communicate our vision and position ourselves appropriately in the marketplace.

It has also allowed us to connect with technical experts in machine learning to validate our idea and take actionable steps to achieving our goals. Finally, YSYS has been instrumental in connecting us with like-minded edtech entrepreneurs to explore the viability of collaboration thereby improving our overall value proposition to the students, teachers and other ecosystem stakeholders.

What have been the major challenges you've faced and successes you've had while running Edicat Learning?

There are two primary challenges we have faced in our journey.

Firstly, our solution is a unique confluence of psychometrics, machine learning and cognitive science. To understand the fields and propose a synergistic solution that is accurate, research-driven, achievable, scalable and one that will improve student learning outcomes is the biggest challenge we faced.

Secondly, identifying and putting in place a passionate and well-balanced team with domain and technical expertise to convert our vision into reality was also a daunting challenge. Thankfully, we got acquainted with individuals who are talented and experienced in creating full-stack machine learning solutions, who are very passionate about our mission of making personalised learning accessible to all.

We have been lucky to have encouraging wins to push us and work even more to convert our vision into a reality.

Successes were with respect to winning grants and competitions, positive feedback on the idea especially on the immediate need for such a solution, positive feedback from users on the prototype and finally securing interest from parents, schools and a university.

Our business has been validated by business experts at QMUL Enterprise, whom we are duly grateful to for selecting us to receive grant funding as part of the Build It Award to support our MVP development. We also qualified as one of the top 25 teams for the Samsung Solve for Tomorrow initiative together with receiving AWS credits from their EdStart program. Further, we were part of accelerators such as YSYS, Barclays Eagle Labs and UCL Machine Learning boot camp.

We have also trialled an early prototype of the platform with 50 students, 85% of whom said they would recommend it to their peers.

This gave the proof-of-concept that students benefit from using our platform. Finally. we have also received expressions of interest by schools and universities, including Imperial College London to potentially use our platform after development.

Article by FLORENCE WILDBLOOD