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EDUCATION SERVICES

A SECTOR STUDY

2022

Contents

Glossary

Ed-Tech. Short form for Education Technologies. Like Fin-Tech for Financial Technologies. Ideas, teams, businesses using technology to solve content, access, reach, affordability and availability challenges in education services.

ECD. Early Childhood Development.

ECE. Early Childhood Education.

SMB. Small and Medium sized Businesses.

SSC. Secondary School Certificate. A regional board examination system that assess grade 9 and grade 10 students through standardized curriculum and examination format.

HSC. Higher Secondary School Certificate. A regional board examination system that assess grade 11 and grade 12 students through standardized curriculum and examination format.

O Levels. UK origin education system equivalent to SSC standard with one difference. 11 years of schooling versus 10 under SSC system.

A Levels. UK origin education system equivalent to HSC standard. Students assessed in 12^{th} and 13^{th} year of education.

Inter or Intermediate Examination. Alternate term for HSC examination in Pakistan.

SAT. Scholastic Aptitude Test. Standardized test used for US undergraduate college applications.

GRE. Graduate Record Examination. Standardized test used for graduate applications.

GMAT. Graduate Management Admissions Test. Standardized test for US business school applications.

MCAT. Medical College Admissions Test. Standardized test used for US medical school applications.

MDCAT. Medical and Dental College Admission Test. Standardized test for medical school applications in Pakistan.

ECAT. Engineering College Admissions Test. Standardized test for Engineering school applications in Pakistan.

BCAT. Business College Admissions Test**.** Standardized test for business school applications in Pakistan.

USMLE. United States Medical Licensing Examination. Three step examination system required for receiving a medical license in the US.

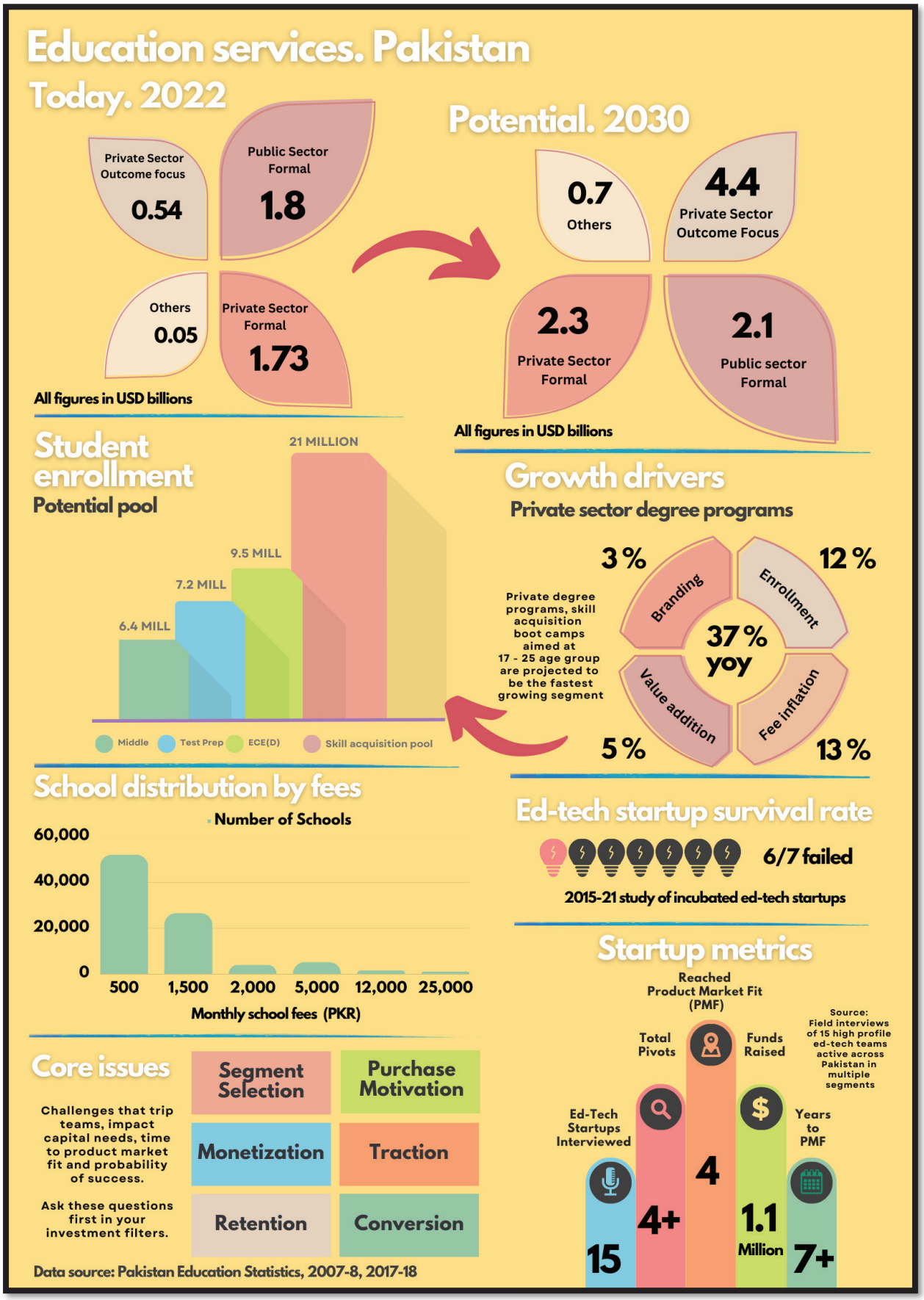
PLAB. Professional and Linguistic Assessment Board. Examination system required for receiving a medical license in the UK.

UX / UI. Short form for User experience and User interfaces. A field at the intersection of design, interfaces and technologies that focuses on creating simplified, intuitive experiences for customers that lead to an increase in utilization and engagement.

TAM. Total Addressable Market.

SMEDA. Small Medium Enterprises Development Authority.

Executive Summary

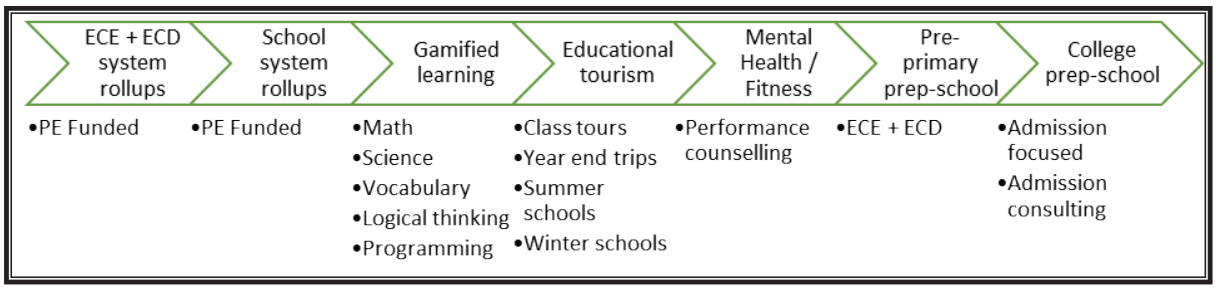


The education services market in Pakistan generates annual value estimated at **$ 9.25 billion**. Of which **$4.8 billion** represents untapped opportunities in private sector, $4.1 billion [1]represents current opportunities across sectors and $300 million represents untapped public sector potential.

Segment	Current	Untapped	Potential
Public Sector - Formal Ed.	1,820,780,743	300,000,000	2,120,780,743
Private Sector - Formal Ed.	1,734,076,898	520,223,069	2,254,299,967
Tuitions	272,221,402	544,442,805	816,664,207
Test Prep	118,360,952	1,420,331,422	1,538,692,374
Bootcamps	85,723,093	1,714,461,853	1,800,184,946
Others	45,000,000	675,000,000	720,000,000
Total	**4,076,163,087**	**5,174,459,149**	**9,250,622,236**

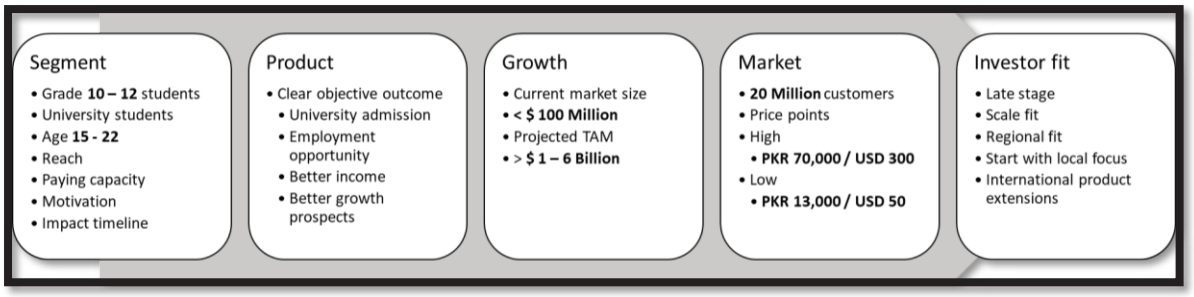
From a growth perspective public sector share is expected to shrink in future years as enrollment and revenues have been flat in the last decade. As the state's ability to investment in education is crowded out on account of non-development expenditure and debt servicing, demands on the private sector will increase.

Compared to the public sector, private sector revenues are likely to grow at **17%** over the next 5 years. The fastest growing segment within the private sector is college and university degree programs. Revenues with this segment are expected to grow **30%** annually for the next 5 years. Untapped opportunities within the private sector exist in multiple arenas. As an investment fund there are two capital allocation models available. Impact or venture. The models differ in return profile, investment time horizon, risk, check size, reach and selection filters.



From a venture perspective, two of the biggest untapped segments are skill acquisition boot camps, exam test prep for secondary school, higher secondary school and university admission tests and interview preparation. Boot camps are estimated to have a market share under US$ 100 million but are likely to grow to potential market size between $1 – $6 billion over next 10 years. Skill focused boot camp target potential pool of 21 million customers and are likely to create annual incremental income generation within that pool of billion dollars for 100,000 customers trained.

[1] Government of Pakistan, Academy of Educational Planning and Management. (2009). "Pakistan Education Statistics 2007–2008". Islamabad.
Government of Pakistan, Academy of Educational Planning and Management. (2021). "Pakistan Education Statistics 2017–2018". Islamabad.



From an impact perspective the two big segments are teacher training and ECD. Given pressures on private sector there is significant interest in teacher assessment, training, and certification but cost is an inhibiting factor. ECD models range from pre-natal education and care, maternal and child nutrition, post-natal education and care, early childhood engagement, exposure, assessment, social stimuli and maternal support. Like middle school system rollups, there is an opportunity for ECE and ECD rollups emphasizing cost savings by centralizing content, testing, training, hiring, resources, standardization, branding, billing, accounting, and systems. Return profiles for opportunities in these segments can be structured as impact investment, patient debt or private equity.

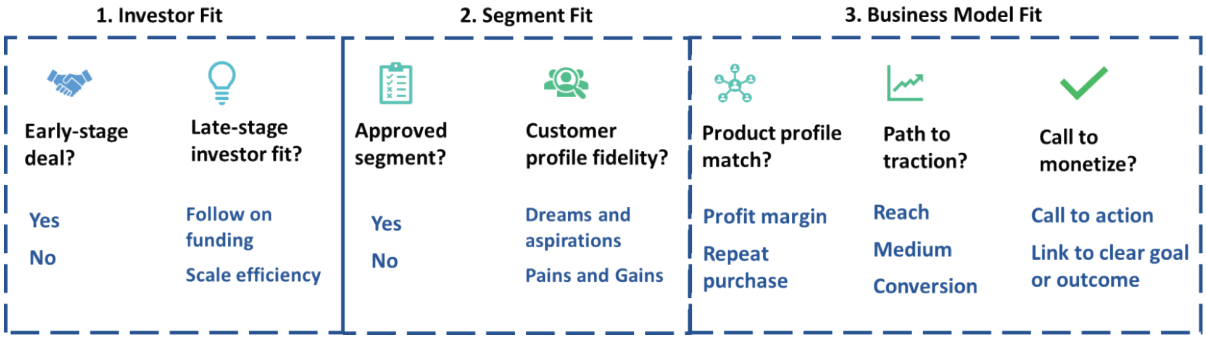
Given the cost structures within education services space, cost savings or cheaper products will not provide a strong or sustainable competitive edge. Education is considered an investment towards better futures. To convince customers to switch from existing service providers quantification of value is required. Where this value is linked to clear outcomes, goals or objectives, traction and monetization are possible. Where the link or value is missing, so are traction and monetization.

Education is essentially a market that sells **better and brighter futures**, not necessarily **cheaper futures**. Value more than cost savings is the purchase driver for buyers. When selecting ideas, quantification of value and its impact on selected segments are two important considerations. This assessment is supported by the transition from public schools to low-cost private schools across Pakistan. Higher enrollment, value addition, branding and inflation are four pillar driving private sector growth in education services. All four are likely to inch higher in coming years.

Segment and product selection are important filters for education services startups, founders and SMBs. A cohort of local incubated ed-services startups between 2015-2021 clocked a 15% survival rate. Within a second cohort of active ed-tech startups interviewed for this report, only 46% reached traction and product monetization. The ones that did reach that goal raised over $1.1 million in grant and equity funding, took 7 years and 3 pivots to reach traction. 4 of the 7 teams found traction in the Test prep market focusing on a single segment that represents 11% of enrolled private sector students.

That segment is the secondary and higher school student segment. It stands out because it is easier to quantify short term value due to clear outcomes and goals - pass an exam, get into the right college, start on path to higher income. It is easier to reach – most high school students have a personal mobile device and are part of interconnected networks. It is growing – higher enrollments because of demographic, urbanization, gender drivers. It has paying capacity – because of part time jobs, tuitions, and side hustles. It aspires and dreams of better futures.

Clear outcomes and goals, reach, traction, growth, paying capacity and aspirations for self-improvement are the right filters to use in segment selection in education services space. These are better predictors of future success of startups and investments than enrollment or market size.


1. Investor Fit
2. Segment Fit
3. Business Model Fit
Early-stage deal?
Yes
No
Late-stage investor fit?
Follow on funding
Scale efficiency
Approved segment?
Yes
No
Customer profile fidelity?
Dreams and aspirations
Pains and Gains
Product profile match?
Profit margin
Repeat purchase
Path to traction?
Reach
Medium
Conversion
Call to monetize?
Call to action
Link to clear goal or outcome

Introduction

Pakistan's growing middle class aspires to have a better and brighter future and education is often seen as a primary conduit to enabling this sort of growth. If a business could clearly establish the link between education vis-à-vis skill acquisition and income generation, while subsequently helping them in concrete ways to achieve desired outcomes, customer traction will not be a challenge. Income generation – which often translates to upward mobility with respect to socio-economic status (SES) are both powerful motivators for purchasing products.

For decades private education providers have built on the promise of better futures. Besides food, education is one of the most common sectors small entrepreneurs start businesses in. Side by side with food[2], education tops the list of businesses small business owners think of first. Visit any small city or large town, with the corner grocery store, you are likely to find enterprising owners selling lunch on a plate and schooling in small bungalows.

The objective of this document is to

- Identify and recommend untapped future opportunities in education services space.
- Quantify size, scope, market demand, and growth potential of sectors and sub segments.
- Assess existing resources, activities, and key constraints within the sector and suggest potential solutions to the problems listed

Market Trends

Five recent trends increase the likelihood of winners in ed-tech sector.

I. Covid-19 and remote education. The biggest recent benefactor for Ed-Tech was the forced isolation imposed on account of Covid-19. The 24-month period turned the globe into one big experimental lab for remote learning. We learned more from mistakes made in these two years than we did in the last forty years. Locally as well as globally we now have a sense of what works and what doesn't when it comes to remote education.

II. Digital payments. Within Pakistan's market the second big shift was the move to **digital payments**. Not necessarily credit and debit cards but IBFT, RAAST and mobile wallets. Trust level associated with payments made ahead of purchase and shipment increased reducing reliance on cash on delivery as a method of payment.

III. Smart phones and Ed-Tech startups. The third shift is the large cohort of Ed-Tech startups that came on the scene after the influx of smart phones in Pakistan. It didn't matter if they survived or died, every team helped map out potential paths to traction and monetization. The segments and thesis that worked as well as the ones that did not. Marketing dollars spent by these teams have helped increased awareness across all core segments.

IV. Bandwidth and Infrastructure upgrades. The fourth trend is our biggest break. The ramp up in available local bandwidth and infrastructure. Planned national internet bandwidth capacity will rise from 6 Tbps in 2016-17 to 96 Tbps in 2022[3] with induction of the PEACE cable to the national submarine cable network.

[2] Anecdotal evidence based on a survey of middle- and low-income residential neighborhoods in Karachi. Estimates from conversations with CERP and Taleemabad field interviews suggest between 120,000 – 180,000 low fee private schools in Pakistan.

[3] Peace Cable spliced and ready for service. Expected activation before end of year for Pakistan.

V. Private sector to the rescue. The fifth trend is private sector intervention in education services. Private sector solutions to gaps in education market are visible from pre-primary to college and university education. Growth in enrollment is one indication. The second is growth in number of institutions. A third is increasing acceptance and proliferation of private schools in inner cities and peri-urban localities. As competition between smaller schools intensifies, teaching quality and exam results becomes a marketing tool for schools. With inflation likely to stay in double digits for next 3 – 5 years, private sector education revenues are expected to grow at 20% year on year for the next 5 years.

Market Sizing

Student Enrollment

Over the last decade private sector enrollments in Pakistan have been steadily rising at 6% a year. Assuming future growth rates are similar to historic averages, private sector student enrollment is likely to cross public sector enrollment in the next twelve years.[4] The top segments at the enrollment level are **primary, pre-primary, middle schools, and others**. **Others** represent an alternate informal path of education for many students.

Segment	Private Sector Students	Public sector Students	Total Students
Pre-primary (ECD + ECE)	4,660,057	4,828,534	9,488,591
Primary	6,599,000	12,065,000	18,664,000
Middle	2,184,000	4,238,000	6,422,000
High School	996,000	2,353,000	3,349,000
Others	3,528,456	1,773,393	5,301,849
Inter-Grade	187,794	1,494,133	1,681,927
Degree Colleges / Universities	441,641	1,738,766	2,180,407
Total	18,596,948	28,490,826	47,087,774

Table 1. Public and private student enrollment. Source: Pakistan Education Statistics, 2017-19.

As data in Table 1 above indicates three key enrollments drop off points in education are:

a) Primary to middle school,
b) From middle to high school and
c) From high school to inter grade examinations

As shared later in the report, the drop off rate is not always a reflection of per financial constraints. Other issues include student assessment, perceived value of higher education, skill development and access to school that offer enrollment in higher grades.

[4] Private sector enrollment grew at 6% while public sector student figures grew at 1.25% annually between 2007-8 to 2017-18. Source Pakistan Education Statistics 2007-8 and 2017-19.

While public sector education will continue to play a significant part within education services, private sector growth and investment in the education sector is likely to dominate public sector investment.

"Others" category	Private	Public	Total
Non-Formal Basic Education	-	1,425,405	**1,425,405**
Education Foundations	3,366,980	-	**3,366,980**
Technical & Vocational Institutions	156,111	277,126	**433,237**
Teachers Training Institutions	5,365	70,862	**76,227**
	3,528,456	**1,773,393**	**5,301,849**

Table 2. Break down of other category within education services. Source. Pakistan Education Statistics 2017-19.

Number of Institutions and Teachers

Our second sizing metric is **number of institutions and teachers,** because it gives us relative size, capacity utilization, quality of teaching and teaching load across public and private sector educational institutions.

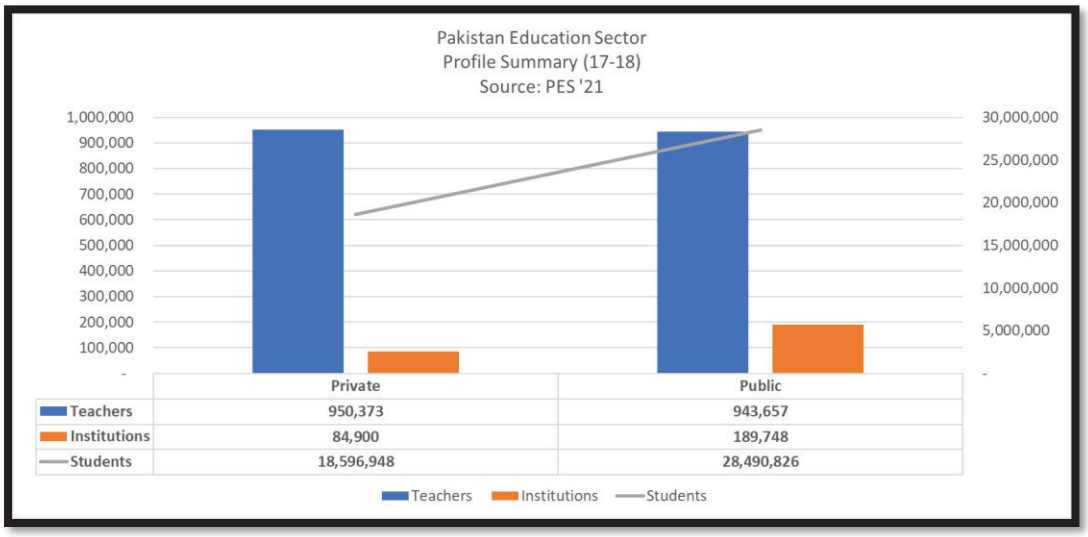


Figure 1. Pakistan education services sector. Teachers, institutions and student enrollment. Source, Pakistan Education Statistics, 2017-19.

While public sector has more than double the number of institutions and fifty percent more enrolled students compared to private sector, **private sector still employs more teachers.** This is indicative of the load on public sector education and one reason behind the increasing shift towards private schools.

Compared to public sector, private sector is easier to work with for vendors. Specifically in terms of pitching, contracting, purchasing and decision-making processes. However, private schools are under pressure due to Supreme court decisions on school fee increases and are reluctant to pass on additional charges to registered students. Despite this, in preceding eleven years, using limits imposed by the court, private school fees would have still grown at an annualized rate of 8.3%. Under Supreme court limits they would have still grow 2.6 times over the original base. Yet large investments in technology infrastructure are not a priority for all schools. In addition to capital,

successful technology deployments require support from owners, school administration, teachers, and students. While owners and students are beneficiaries, overworked administrators and teachers have little incentive to contribute time and effort to such implementations.

End users and decision makers for education products aimed at students are not school administrators or teachers but private school students and their parents. Diligent and middle-class parents opt for supplementary tuitions at home or at tuition centers when their children are struggling with specific subjects. For motivated students, access to a resource may be financed by parents, but selection is often done by students themselves. They identify the resource, curate the content they want and ask parents for financing. Private sector students correlate with segments that have the capacity to pay, a desire to seek better outcomes and are willing to pay more for better value and superior products.

A Direct to Consumer (DTC) strategy is likely to fare better than a Business to business (B2B) model.

Private sector. Revenues and cost base.

To convert student enrollment into fees we use a distribution of school fees to estimate market size of the private sector. **While enrollment, institutions and employed teachers are useful indicators of size, for investment purposes, a financial metric linked to revenues or profits in rupee or dollar value is needed.**

We start with an estimate for the private sector as of today. We then extend our model to public sector in the section that follows and untapped opportunities within both sectors to reach a total market size.

	Age	Segment	School fees	Private Tuitions	Exam Test Prep	Bootcamps	Total
1	1-5	Pre-Primary (ECE + ECD)	397,574,232	-			397,574,232
2	5-9	Primary	562,995,766	112,599,153			675,594,919
3	9-14	Middle	186,328,649	37,265,730			223,594,378
4	14-21	Others	301,031,336	-		30,103,134	331,134,470
5	14-19	High School (8-10)	127,446,126	89,212,288	50,978,450	12,744,613	280,381,477
6	17-21	Inter - Grade 11-12	47,348,902	33,144,231	28,409,341	9,469,780	118,372,254
7	19-27	Degree colleges/ Universities	111,351,887	-	38,973,160	33,405,566	183,730,613
		Total (USD Equivalent)	**1,734,076,898**	**272,221,402**	**118,360,952**	**85,723,093**	**2,210,382,345**

Table 3. Private sector market sizing estimates. Source internal market projection model based on student enrollment, school fee distribution. Primary source, Pakistan Education Statistics, 2017-19

Unlike the public sector, private sector includes three additional sub sectors. Private tuitions, exam test prep and skill acquisition boot camps. All-inclusive the private sector generates **US$ 2.2 billion** in estimated revenue today.

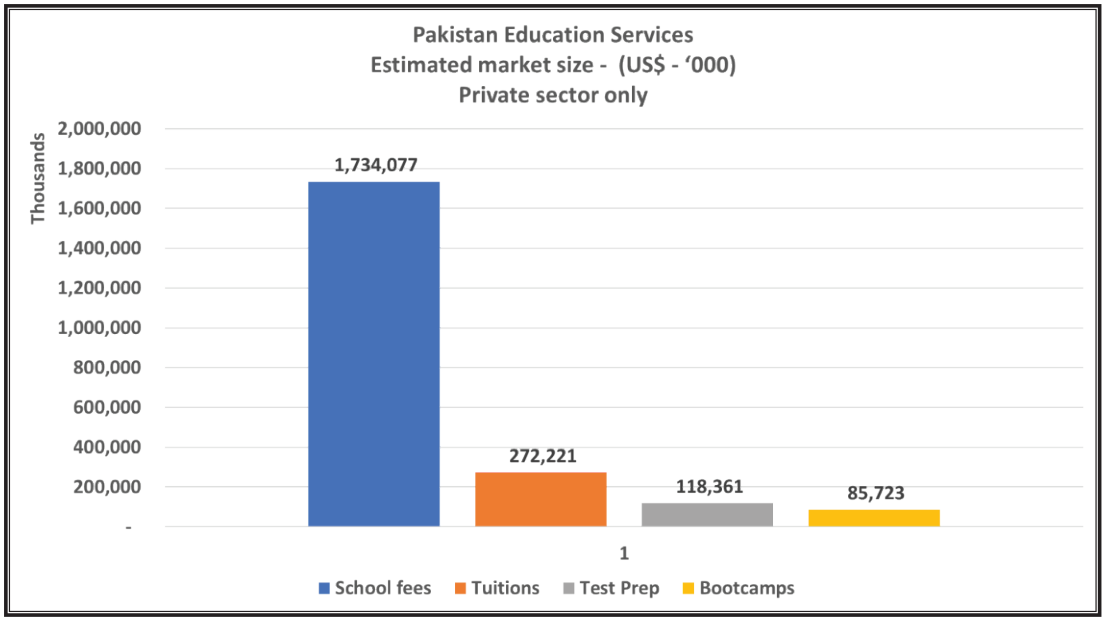


Figure 2. Pakistan education services sector. Relative sizing of private sector market segments. Source, internal projection model.

The allocation of private schools and tuition center revenues across expense heads presents an important insight into market structure for startup teams using digital models.

26% of private school revenues are allocated to physical infrastructure. **34%** to teacher salaries. **33%** to profits. **7%** to taxes. A digital player using live instructor-based cohorts is likely to only displace **26%** of the cost base of physical competitors. A digital team may not need physical infrastructure to house and accommodate students, but they still need teachers. A willingness to work with lower profits to capture market share may increase that percentage to **40%**.

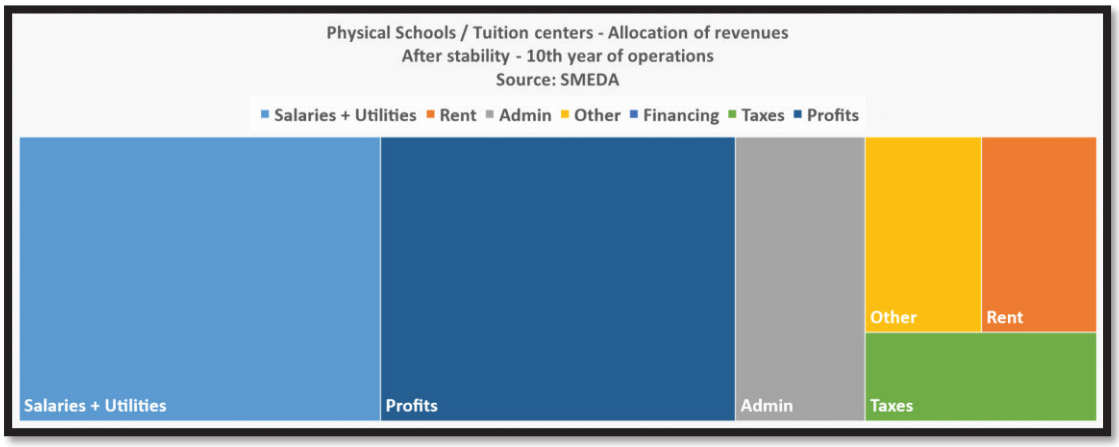


Figure 3. Expense breakdown of physical schools and tuition centers. Source, SMEDA Pre feasibility study, high school franchise, Aug 2015.

40% by itself is not enough of a motivator for satisfied customers to switch to substitute products. Just being cheaper does not disrupt the market. Perceived value in such instances must come from other product attributes. **Lower cost cannot be a competitive advantage** for challengers in instructor led models. Proposed advantage can be linked to lesson plan flexibility, access to star

faculty and teachers, self-assessment tools, competitive benchmarking with a larger student pool, supplementary resources, time savings or more.

In the pre-recorded video lessons space, once initial capital investment in recording videos is complete, comparative margins can be twice as high. The marginal cost of streaming a video second time is lower than the cost of recording, editing, and posting it for the first time. Once a video is recorded and available for viewing it can be used for the next 5 – 20 years.

A key component in digital space is cost of building an effective digital conversion funnel. A digital conversion funnel attracts prospective customers to digital properties owned by an ed-tech startup, engages them with relevant content to build credibility and trust, presents them with a call to action and converts them into paying customers by using a combination of financial incentives, user testimonials and behavioral triggers. A similar model or expense head does not exist in the world of physical competitors.

Evidence from our sample data set on ability of local companies to execute on digital conversion is mixed. Customer acquisition costs (CAC) using conventional digital marketing channels adjust and start to rise once a conversion channel is validated by sales. Google, Apple, Facebook and TikTok advertisement algorithms push bid rates higher for successful target segments and keywords daily. Effective conversion models use digital customer acquisition on a seasonal and supplementary basis. They emphasize search engine optimization for lead generation, landing page and conversion optimization models focused on page speed, responsiveness, and testimonials. They build on reducing clicks required to checkout, repeat purchases, email campaigns and customer retention. The best teams use digital ad spend as a complimentary support pillar, not the primary or singular pillar in their digital acquisition strategy.

Total Addressable Market

Public and Private sector

Taking all the data points together, our estimate for total addressable market for educational services in Pakistan is **US$ 9.25 billion**. We use our estimates for private sector cost structure, adjust it for public sector size and expenditure to reach an estimate for formal public sector education market.

Current market size including public and private sector is estimated at **US$ 4 billion.** At present untapped potential future opportunities across both sectors are estimated at **US$ 5.2 billion**. [5]

Untapped opportunities include a) markets that exist today but do not generate revenue, b) opportunities represented by future growth and c) markets that may not be viable today but will be in near future.

[5] Source: Internal market size projection using primary data from Pakistan Education Statistics 2017-18.

Segment	Current	Untapped	Potential
Public Sector - Formal Ed.	1,820,780,743	300,000,000	2,120,780,743
Private Sector - Formal Ed.	1,734,076,898	520,223,069	2,254,299,967
Tuitions	272,221,402	544,442,805	816,664,207
Test Prep	118,360,952	1,420,331,422	1,538,692,374
Bootcamps	85,723,093	1,714,461,853	1,800,184,946
Others	45,000,000	675,000,000	720,000,000
Total	**4,076,163,087**	**5,174,459,149**	**9,250,622,236**

Table 4. Current tapped and potential untapped market sizing. All figures in USD. Source internal market projection model based on student enrollment, school fee distribution. Primary source, Pakistan Education Statistics, 2017-19

For public and private formal education segments, untapped opportunity is a function of reach and financing. Financing makes it possible for schools to offer better value to student communities by hiring new teachers, retaining better teachers as well as open new campuses.

Newer campuses improve access increasing enrollment in previously unserved communities. The likelihood of children attending nearby schools improves as distance they need to travel from home to get to school reduces.

Addressing financing and access is likely to increase size of the formal education pie by 30%. In peri-urban and rural areas school enrollment is a function of access and distance a student needs to travel. Availability of capital makes it possible to open more schools or franchise branches, directly impacting enrollment figures. Enrollment is also a function of better teachers. Better teachers are in demand and need to be paid higher salaries. In the absence of financing the two sectors will continue to grow at their existing historical growth rates.

Growth in private tuition is also linked to affordability and access. Digital tuition providers improve affordability by using online instructor led cohorts or pre-recorded online video lessons. In some instances, digital products are 3x to 5x cheaper than physical counterparts.

Low fidelity extensions of the same market are topic notes, flash cards, revision lists, review challenges, practice, test and guess papers. In the absence of high bandwidth internet, low fidelity products fill gaps for students living in poor network coverage areas. Higher penetration of smart phones, improving internet bandwidth, increase in network coverage are all likely to improve access and increase size of student community that can utilize and benefit from alternate solutions.

The first three segments listed above in the formal sector are unlikely to experience 10x[6] growth in the future. 10x growth is growth that will push market size ten times beyond current estimates. Historically speaking such growth often originates from markets or conditions that don't exist today. Given age specific enrollment figures and restrictions on private school fees it is unlikely that these

[6] In venture investments one investment selection criteria is projected future growth. Not growth at ordinary or normal growth rates but hyper growth. 10x growth is a proxy for hypergrowth. It is a framework used to identify opportunities where intervention using solution design, consumer needs and capital can generate hyper growth and create substantial value in 5 to 10 years.

two markets will become ten times their current size in the next ten years. The private tuition market is also closely linked to school enrollment figures.

Untapped markets come in three flavors. It is important to understand the timing difference between the investment horizon of an investment fund and these markets.

a) **Short term** plays. The opportunity exists today and is likely to convert into significant value creation in 3 – 5 years.
b) **Medium term** plays. The opportunity does not exist today in its complete form. It is likely to take a decade or more of hard work and commitment to realize commercial potential.
c) **Long term** play. There is a hint of opportunity but no certainty about timelines required to realize commercial potential.

We address two markets from our short-term play list next. **Test prep and bootcamps.** Following that we also look at opportunities from our long-term playlist.

Demand Drivers

Every year 1.6 million Pakistani students drop off in the transition from middle school to secondary school, from secondary school to high school and from high school to university and college admissions. Essentially locked out of the higher education system in Pakistan.

Transition to each class with respect to previous year enrollment in the lower class

Class	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	Average	Cummalative
1	**100%**	100%	100%	100%	100%	100%	100%	100%	100%	100%	**100%**	**100%**
2		**84%**	83%	84%	81%	85%	85%	87%	88%	91%	**85%**	**85%**
3			**88%**	87%	86%	89%	87%	88%	89%	90%	**88%**	**75%**
4				**88%**	88%	91%	89%	91%	93%	95%	**91%**	**68%**
5					**87%**	90%	89%	84%	87%	91%	**88%**	**60%**
6						**84%**	82%	84%	88%	89%	**86%**	**51%**
7							**92%**	93%	95%	97%	**94%**	**48%**
8								**92%**	95%	98%	**95%**	**46%**
9									**96%**	102%	**99%**	**46%**
10										**87%**	**87%**	**40%**

Source: PES Education statistics - 2017-18
Segment: Public sector schools

Table 5. Student enrollment Transition matrix. Public sector schools.

The drop off is not just for financial reasons. Families invest in education, but they invest when they see a return on their investment. If a child continues to fail and not do well, lower income family resources are directed to other children or uses. Children also give up because of a mismatch with interest or capability, negative feedback loop, absence of guidance or counselling at the right time, sometimes even inability to understand how the examination system works.

Often the issue is not intelligence or competence but planning, preparation and familiarity with examination framework and questions. **Guided exam taking practice is a small intervention that can yield surprisingly powerful results.**

The reasons behind the drop off rate indicate the many needs in this space. **Practice papers, exam prep, guidance, counselling, feedback loops, career alternates, capability assessment, benchmarking, upskilling, and repurposing**.

Some of these students take a second shot at the examination system. Others join the workforce. A small percentage evaluates and explores alternate options for skill acquisition and employment.

Those fortunate enough to have the option join a business owned by immediate or extended family members. But the rest are locked in low-income, low-profile, low yield careers.

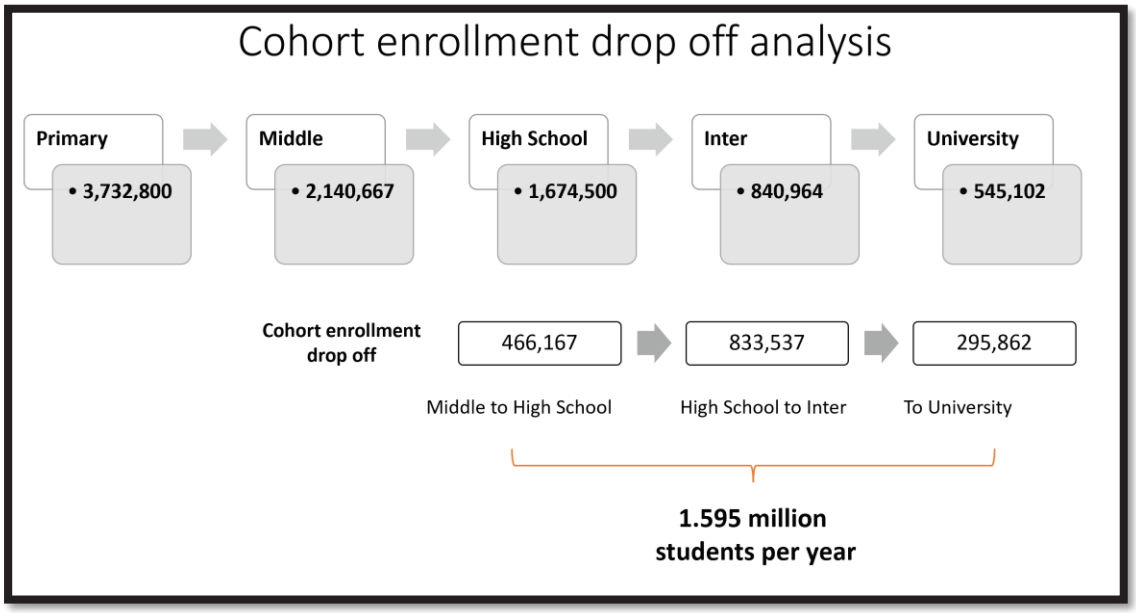


Figure 4. Drop off analysis to estimate size of market for skill focused boot camps. Source Pakistan Education Statistics 2017-18

Reconciliation to determine drop off percentages from secondary school (SSC) exams to high school (HSC) exams using alternate data sources suggests that our original estimates are within reasonable range of actual realized numbers.

High School	Private sector	Public sector	Total
Starting Cohort	996,000	2,353,000	3,349,000
Natural drop out	**199,200**	**470,600**	**669,800**
Shift to public sector	348,600	348,600	348,600
Private candidates	99,600	99,600	99,600
Emmigration	29,880	70,590	100,470
Shift to vocational school	156,111	277,126	433,237
Unexplained	**174,015**	**488,751**	**662,766**
Inter Grade / End Cohort	**187,794**	**1,494,133**	**1,681,927**

Table 6. Student enrollment Transition matrix reconciliation. Public and private sector schools.

The pool grows bigger every year. Using a rolling window looking back 6 years (from 2017 – 2022), we estimate there are **11.2 million** students between ages 15-24 who fall in this bracket today. In the next 4 years (from 2023-2026), another **10.2 million** locked out students will be added to this pool.

A segment that grows from 3.3 million students in 2017-18 (2-year window) to 5.3 million students in 2025-26 (2-year window) is indicative of deep structural issues. And a significant untapped market

opportunity. **While multiple teams are focused on the exam test prep market, the boot camp market, given the size of the above pool, remains largely untapped.**

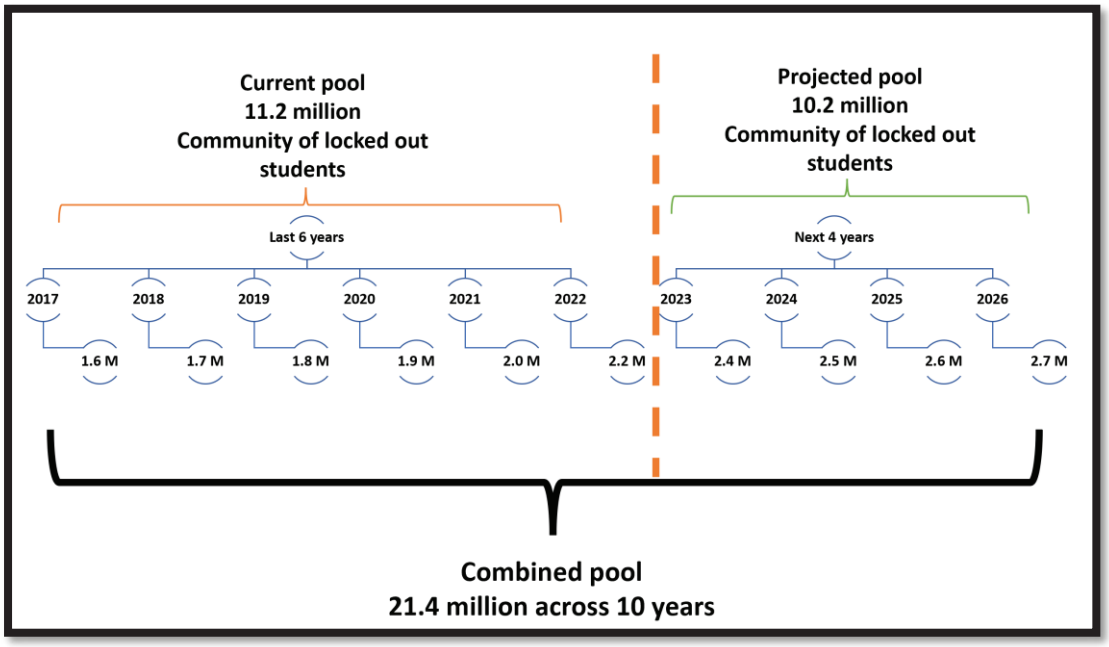


Figure 5. Rolling drop off analysis to estimate size of market for skill focused boot camps. Source Pakistan Education Statistics 2017-18

From an impact perspective bootcamp products leading to better and higher paying employment opportunities create visible, quantifiable, and measurable impact in lives of their customers. Skill acquisition bootcamps can improve annual earnings prospects by US$ 1,000 to US$ 3,000 within a year of training completion. While these programs start with a small footprint, enrollment shoots up once word get around of job prospects.

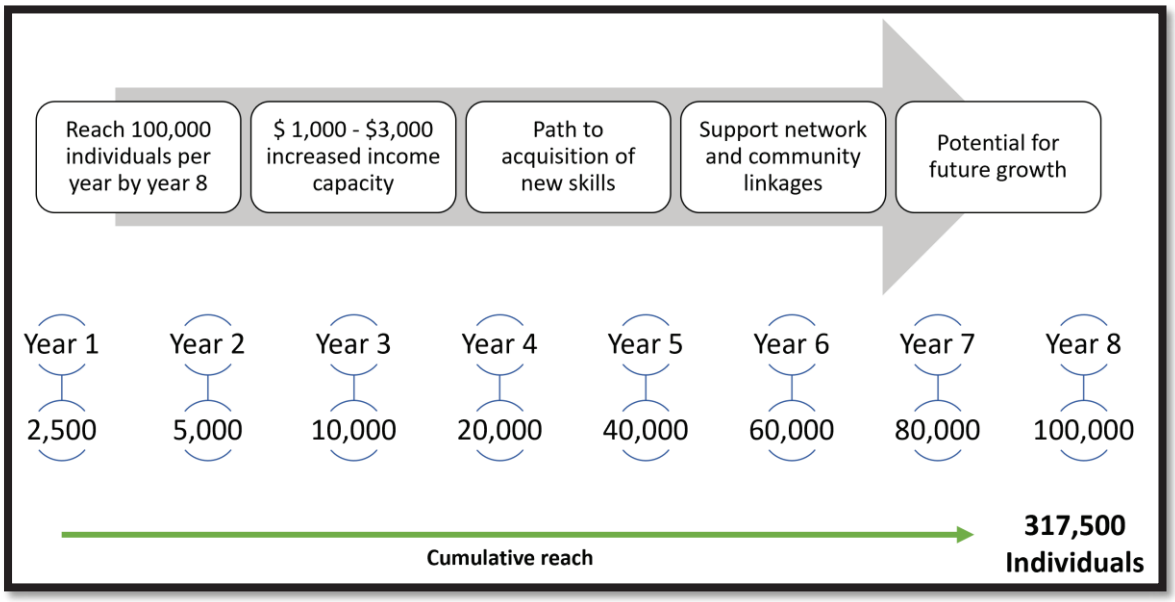


Figure 6. Income impact analysis on targeted and reached pool. Source internal projection model.

Segment Assessment

The test prep and bootcamp models appear to be great fit for this segment. We use a six-factor evaluation checklist[7] to make this call.

I. Paying capacity. Age group between 15 – 24 is financially semi-independent. If you are not going to college or university, you are most likely working somewhere. Even teaching at home tuition generates discretionary spending power.

II. Reach and access. Beyond 18 years, access to a mobile phone is getting increasingly common. With reduction in prices of second-hand smart phones, feature phone get replaced by low-cost smart phones. The segment is reachable through their personal devices.

III. Growth. Doubling up every 5 – 10 years in size. Closely connected via peer and social networks. If the product works and creates value for a few members of the network, it is likely to be shared widely across the network. The segment comes with built in organic growth and virality loops.

IV. Purchase motivation. A link to a clear outcome, goal, or personal milestone. Passing an exam, picking up a certification, acquiring a skill that leads to stable higher income jobs.

V. Pricing power. Pricing power is lower in secondary school segment compared to college and university students. For secondary and high school students more emphasis on passing exams than income. Capacity to pay but limited by how expensive or cheap a product is relative to common substitutes. Subjects and grade focused products centered around test preparation are in demand.

VI. Repeat purchases. For customers acquired in high school years, association with the brand lasts into first year at university. A 5-year, multi-subject association is likely to convert into multiple purchases every year for 5 years. If trust can be established, there is natural conversion in university years to skill-acquisition boot camps.

Product nature, complexity, and quality changes as we work with college and university educated students. In college and university segment the stated goal is more difficult. Skill acquisition and learning that can be tested and put to work immediately across a range of tools, skills, and platforms. Given the range of subject choices, expertise levels and practitioner focus, college and university education is a more fractured markets compared to secondary and high school subjects.

[7] We discuss the origins of this checklist later in our report. Source ed-tech field interviews

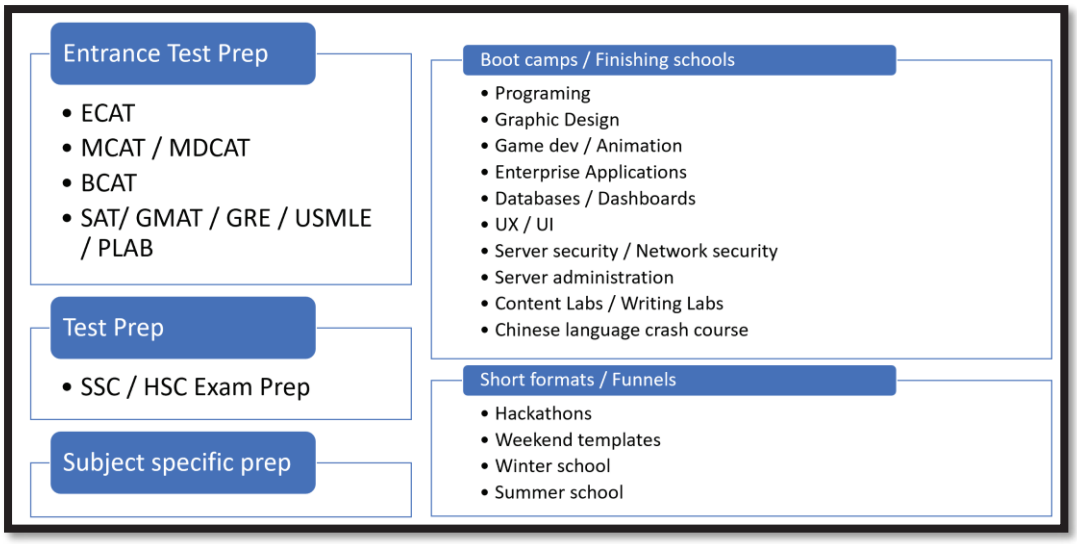


Figure 7. Test prep and boot camp market segments.

Skill acquisition represents a more complex challenge. Compared to passing exams on a standardized template, expectation from skill acquisition is a higher paying job. In addition to teaching skill sets, successful placement requires access to effective referral network.

Motivation across public and private sector colleges and universities are similar. There are differences in paying capacity, but reach, access, messaging, and monetization are similar. This is an advantage of targeting higher grade levels. The market size extends naturally to the public sector.

Figure 8. Proposed segment selection filters.

Segment selection is a key decision for founders because it locks in growth trajectory for 5 to 10 years. The selection once made is difficult to undo because of systems, mindset, and organizational inertia. It takes time to retrain these drivers from their original focus to serve a different segment.

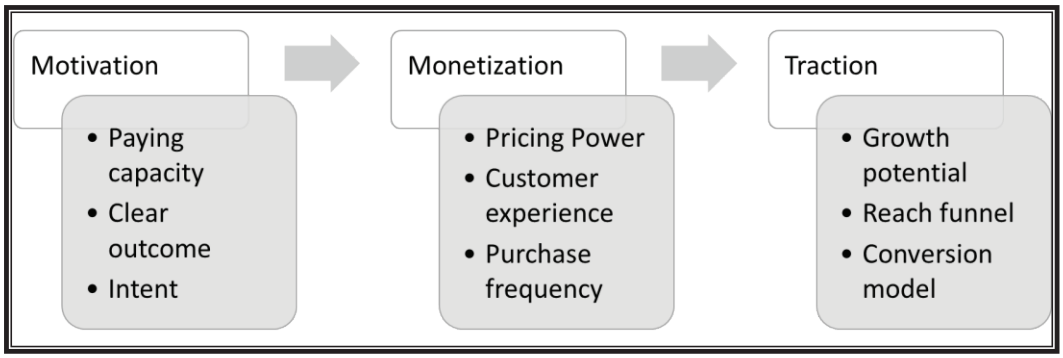


Figure 9. Rational for segment selection filters.

The ability to convert customers, monetize products and gain traction are three key attributes of ventures that succeed. All three are linked to paying ability of selected target customer segment.

Untapped opportunities

Venture Plays

Test prep and boot camp markets represents opportunities at the intersection of three different sub-markets.

Remedial and supplementary resources. The direct linkage between college admissions prospects and grades makes the grade 8 – 12 standards segment a promising and attractive segment for Ed-tech startups. Passing board exams is a clear outcome that parents and families can focus on irrespective of social stature or economic class. We see this validated by focus of startups that have raised funding, gained traction and monetized products.

Exam and Test prep. A competitive sub segment of the remedial space. From a numerical perspective, secondary and higher secondary markets represent a promising opportunity. O and A level exam test prep represents a smaller regional growth opportunity that can start with Pakistan market. Beyond school, university entrance exams, SAT, GRE, GMAT, USMLE, PLAB, MCAT, MDCAT are smaller markets with global appeal that represent an opportunity to expand internationally for local Ed-tech players.

Bootcamps. For university and college going students, skill acquisition and upgradation represents the path to polished resumes, interview opportunities and better job prospects. Zero to hero boot camps make it possible for college and university students to pick up skillsets in cyber security, enterprise application, mobile development, game publishing, machine learning, data analytics, graphic design, animation, and design thinking. Boot camps are popular because they make it possible for participants to benchmark themselves against other candidates in the market, network with employers and receive better offers. Once again, all three represent clear outcomes. **Bootcamps combined with global benchmarking assessment for candidates** represent a killer app [8]for the tech sector hiring market. ***A tool or application that ranks, rate and grade candidates being assessed against the pool of all candidates who have taken the assessment test.***

[8] A killer app is a term used to describe a product, application or service that leads to hyper growth and makes the underlying platform more viable and popular. Desktop publishing - killer app for Apple Macintosh platform. Spreadsheets (VisiCalc, followed by Lotus 123 and Excel) - killer apps for personal computers. Sharing photography shot using cell phone cameras, social networks and games - killer app for smart phones.

Untapped opportunities

PE and Impact

Using private equity models that combine a combination of debt, equity, and external leverage:

a) **ECE and ECD rollups**. Combining early childhood learning centers and school systems under a single learning and management model to standardize curriculum, build brand value, increase name recognition, invest in infrastructure, and reduce operational expenses. In the physical world we have seen City school, Beacon House, Roots, LGS and GEMS use a mixture of franchise and network expansion to improve their reach. A similar model with a few changes can work just as well in the ECE, ECD and middle school space. A recent example is Taleemabad in low-income school space in Pakistan. This is a non-disruptive capital-intensive play that focuses on creating value by improving scale efficiencies across the school network. The demand, market and facilities exit, the play is margin improvement and scale.

b) **Pre-primary prep school.** A less capital-intensive variation on ECD rollup above. Get your child into the right school system and give them a head start right at the start. Test prep for school admissions at pre-primary and primary stage. Similar theme as test prep for college admissions but younger audiences, simpler tools, larger numbers, higher prices, and yearlong school format rather than a prep bootcamp. Purchase motivation is primarily fear of missing out on part of parents actively involved in planning educational futures for their children. A smaller selected segment but with pricing power and an option to move into roll up mode (see (a) above).

c) ECD, ECE and Pre-primary are sectors that witnessed **second fastest** growth in private sector enrollment over last 10 years at **5%** [9]per year. University and college enrollments were fastest at **13%** per year.

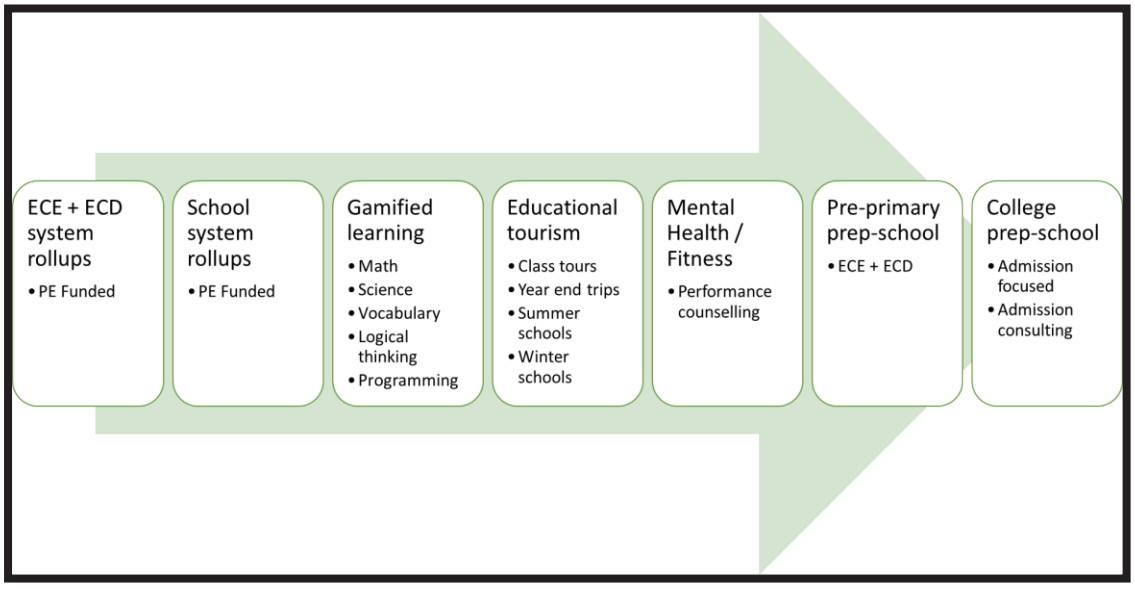


Figure 10. Untapped opportunities within education services.

[9] Source: PES 2017-18 and PES 2007-8 reports.

Using impact models where emphasis is on creating change at ground level rather than just returns:

a) **Gamified learning.** Dedicated STEM facilities such as Robotics Lab, Science ka ada (T2F) and Magnifi-Science[10] center in Karachi, Learn'O'Bots in Pindi and STEM bootcamps. Bootcamps offered in summer and winter breaks to middle school and older students. Dedicated facilities open year-round for school visits, talks and workshops on STEM themes and co-curricular activities. Themes can range from science, math, physics, art, creative writing, public speaking, history and more. This is high impact low return business that can return capital but is not a great fit for a venture portfolio. While there is a clear need for this product, demand is seasonal. Quantifiable impact from a parental perspective is only visible over regular exposure over multiple years. An ancillary benefit is safe spaces can become hubs for building communities and awareness around STEM education (high impact potential).
b) **Educational Tourism**. Middle-income schools are keen for senior students to explore travel as a learning experience. These trips are generally planned in the senior year. While they are common for university students, we are increasingly seeing senior secondary and high school students exposed to planned local and international travel during their graduation year. Curated and guided tours with educational and exploratory themes designed for high school students are a great life-style business with significant room for growth. As more middle-income cohort get to their graduation year, demand for this service is likely to rise. Most small schools don't have the resources to arrange or organize such a trip inhouse. A trusted referred service with a track record and strong testimonials becomes a natural first choice. Impact potential flows both ways. Employment creation at destination. Awareness, ownership and increase in national pride at school and student level. Unfortunately, with seasonal demand and limited potential for scale, this may not be a a great fit for a venture portfolio.
c) **Mental Health and counselling**. Counselling for students transitioning into higher stress senior and high school exam prep years. The move from junior and middle school to secondary school is often a source of concern for students and parents alike. Not all students are able to handle the burden imposed by performance pressure of board examinations. The additional workload strikes alongside stresses imposed by teen years, social awkwardness and transition to new subjects students have not been exposed to before. Counselling services can also be combined with admissions and college counselling. They can be often offered as a co-curricular shared service across multiple school systems. The primary constraint here is the availability of trained counsellors for mental health and college admissions. While self-assessment and case filtering can be managed using automated tools, actual counselling requires one on one engagement.
d) **Teacher Training.** At ECE, ECD, primary and middle school level there is a crisis brewing at enrollment, student to teacher ratios and learning effectiveness. While small schools often start with untrained teachers, schools that hit critical mass need formal solutions to solve teacher onboarding, assessment, and training challenges. Two paths for solutions are possible. One, grade specific teaching certification. Two, tracking and ensuring compliance with said certification. It has a longer-term investment horizon because the path to wide traction across Pakistan is a long and slow path. But once that traction is achieved, annual certification and compliance will represent a steady stream of recurring revenues.

[10] https://www.magnifiscience.org/tdf-magnifiscience-centre/

Sizing untapped opportunities

We estimate between one million to one and a half million children between ages of 1 and 3 years become part of the ECE and ECD market in urban Pakistan, every year.

This estimate is based on income, fertility, marital status, and middle-class household distribution of urban families earning more than USD 300 a month in household income, with 12+ years of formal education, white collar jobs and ages between 25 to 44 years. This pool ranges between 6 to 8 million urban households[11].

ECE and ECD sector is already significant in size. Using venture or private equity funded model to improve scale efficiencies is a well-tested model in similar spaces. This involving rolling up small schools and centers into a centralized franchises or systems. The objective is to improve margins, scale efficiencies, reach and utilization by centralizing key functions. The right team can create significant value using these drivers. We estimate the potential size of this value creation using the rollup model to be worth USD 556 million a year.

Admission preparation support for Montessori and Kindergarten school admission in upscale schools is a thriving sector that has done very well in large urban centers in Pakistan. Pre-school admissions in the right schools are viewed as the first step up that a family can give to their children. Our current revenue estimate for this market is USD 50 million a year. While this is a small market today, it is likely to grow at a faster clip in coming years.

	Segment	Annual Revenue (USD)
1	ECE-ECD Current	397,574,232
2	ECE-ECD-Rollup (potential)	556,603,925
3	ECE-ECD-Admission Prep	50,220,000
4	Learning Aids (Books + Toys)	60,264,000
5	Educational Tourism	84,746,250
6	Mental Health counselling	57,753,000

Table 7. Untapped opportunities. Market sizing estimates.

Learning aids, books and educational toys market today are mostly covered by imported products. Aa slow transition to local titles and ideas has started and is visible in local bookstores. Educational tourism is another growing segment which used to be mostly international but with depreciation of Pakistani currency and covid related travel restrictions is likely to shift to local and domestic destinations.

Mental health and counselling space has picked up traction at a much faster clip both during and post Covid. Acceptability for seeking counseling, help and guidance in teen years is significantly higher today than it was even ten years ago. We believe that the final four segments in the table above are likely to grow 5x – 8x in size over the next two decades.

[11] Pakistan Middle Class, Chapter 19, Founder Puzzles, 2nd Edition, Jawwad Ahmed Farid, Aug 2022.

Software versus content plays

A common choice or decision point in the edtech world is making a choice between technology and content. Should a team invest in building technology or invest in creating content. Doing either one is hard. Doing both is considered a mistake because it disrupts focus in initial years as well as divides crucial resources.

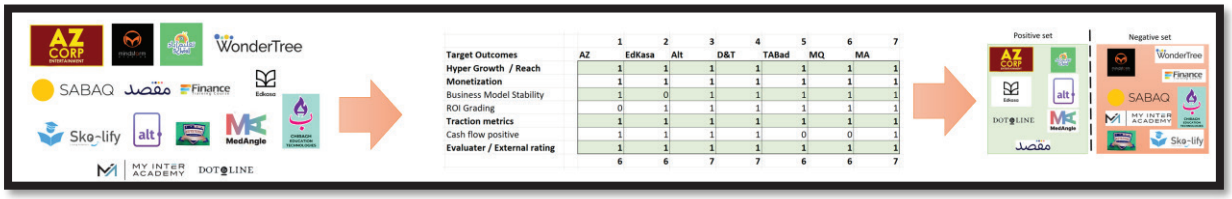
A similar example is building a balance sheet versus building technology in the fintech world. Building a balance sheet is considered a superior strategy than building technology. There is a similar concept at work here. Building direct access to students using content is considered a better strategy than writing or selling technology. Within Pakistani market young private schools are quite competitive and have limited margins available to invest in technology. Established schools have more room but also have higher standards and are much smaller in numbers. Higher education institutions, universities and colleges are bigger and consistent buyers of technology but like established schools are smaller in number are likely to go with established players rather than startups.

Technology and software products take time to build, test and mature. While content can be just as capital intensive, it can be published and consumed earlier, is easier and faster to monetize.

Application of Findings

Investment selection filters

We identified 15 education services teams from Pakistan. Thirteen teams were interviewed. We identified 7 desired outcomes to assess each team. Teams that achieved 6 or more desired outcome were placed in a positive list. Teams with lower achieved outcomes were put on a negative list. We used the positive list as the model for our investment selection filter.



	1	2	3	4	5	6	7
Target Outcomes	AZ	EdKasa	Alt	D&T	TABad	MQ	MA
Hyper Growth / Reach	1	1	1	1	1	1	1
Monetization	1	1	1	1	1	1	1
Business Model Stability	1	0	1	1	1	1	1
ROI Grading	0	1	1	1	1	1	1
Traction metrics	1	1	1	1	1	1	1
Cash flow positive	1	1	1	1	0	0	1
Evaluater / External rating	1	1	1	1	1	1	1
	6	6	7	7	6	6	7

Figure 11. From field interviews to positive and negative lists using positive outcomes.

To build a model around the positive list we identified 31 attributes and evaluated their presence or absence across 15 teams in positive and negative lists. We highlighted attributes that were present in positive list teams and absent in negative list teams. The highlighted attributes along with insights from field interviews became the source for the evaluation filters proposed.

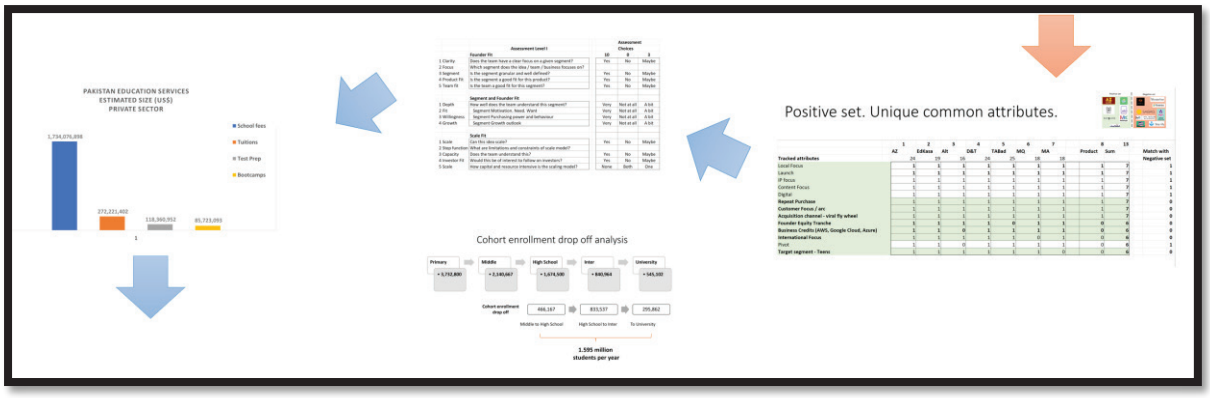


Figure 12. From positive list to investment selection filters

As a test case we applied investment filter to education services market to identify attractive segments. Application of these filtering criteria identified the test prep and boot camp markets.

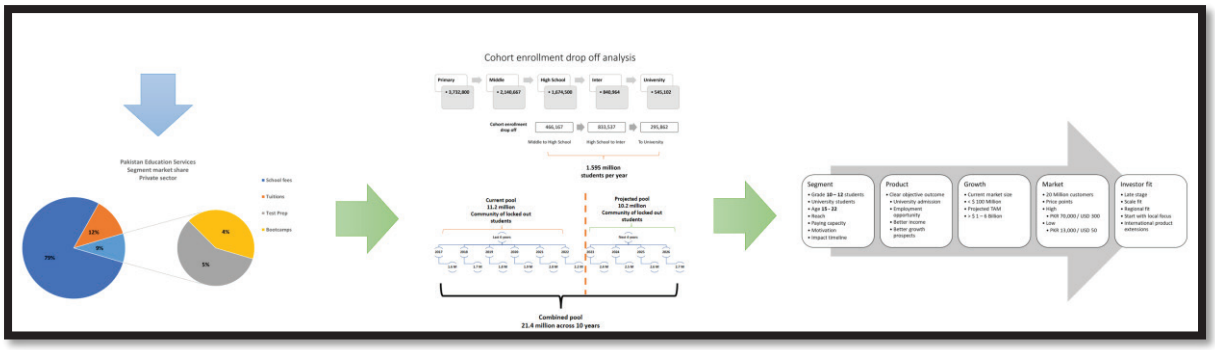


Figure 13. From investment selection filters to sizing opportunities.

Validation

5 of the top 7 teams in outcome assessment came from the Test prep segment. The cutoff threshold was a score of 6 out of 7. All 5 teams in the Test Prep segment reached growth, monetization, and traction. 3 of the 5 had reached the cash flow positive milestone.

	GenoType	Attribute Score	Outcome Score	Team	Type	Category	Age (Years)
1	4	24	7	D&T	Test Prep	Hybrid	8
2	4	16	7	Alt	Test Prep	Digital	4
3	4	18	7	MedAngle	Test Prep	Digital	5
4	5	24	6	A&Z	Co-curricular	Digital	8
5	1	25	6	T'abad	School	Hybrid	7
6	4	18	6	Maqsad	Test Prep	Digital	2
7	4	19	6	EdKasa	Test Prep	Digital	7
8	3	20	5	MS-Labs	Skill focus	Hybrid	15
9	1	16	4	KS-School	School	Physical	8
10	3	16	4	FTC	Skill focus	Digital	12
11	1	12	2	Chirag	Co-curricular	Digital	1
12	1	10	2	Skoolify	School	Hybrid	4
13	5	20	1	WonderTree	Co-curricular	Hybrid	8
14	4	13	1	MIA	Test Prep	Digital	5
15	1	19	0	Sabaq	Co-curricular	Digital	8

Table 8. Field interview candidate outcome scores and segment focus.

From a performance, delivery, and execution lens Test Prep segment had the best results. Target segment for 4 of 5 teams was **secondary and high school students**. One team focused on medical college students, one started with a focus on teaching A level chemistry. 5 of 7 teams used purely digital models.

	1	2	3	4	5	6	7
Target Outcomes	**AZ**	**EdKasa**	**Alt**	**D&T**	**TABad**	**MQ**	**MA**
Hyper Growth / Reach	1	1	1	1	1	1	1
Monetization	1	1	1	1	1	1	1
Business Model Stability	1	0	1	1	1	1	1
ROI Grading	0	1	1	1	1	1	1
Traction metrics	1	1	1	1	1	1	1
Cash flow positive	1	1	1	1	0	0	1
Evaluater / External rating	1	1	1	1	1	1	1
	6	6	7	7	6	6	7

Table 9. Field interview candidate outcome scores.

For bootcamp products, current estimated market share is 2% of education services revenues.

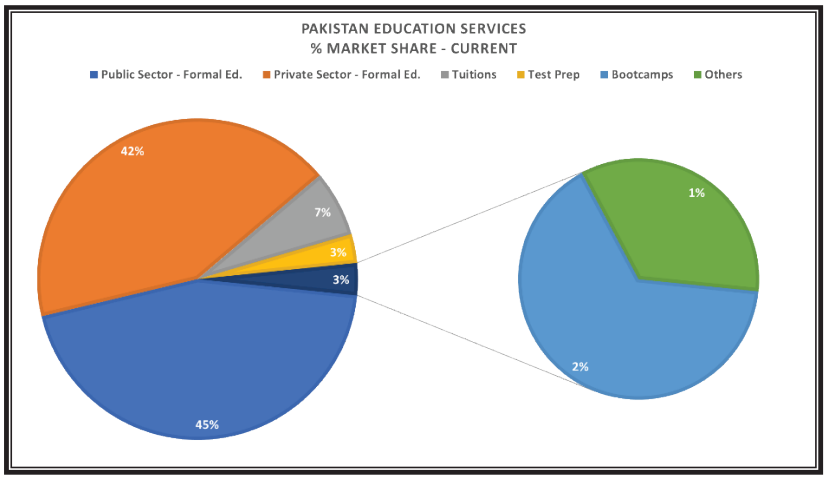


Figure 13. Bootcamps estimated market share today.

Market share is projected to grow 10x to 19% over the next decade as more teams focus on upskilling, assessment and placement products.

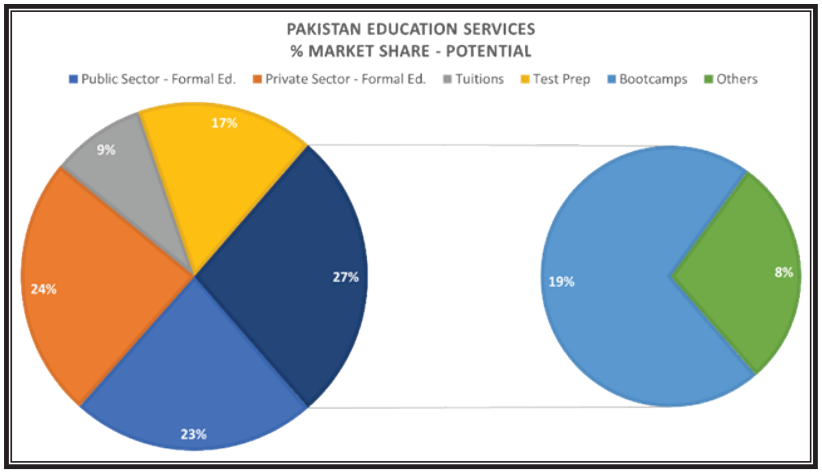


Figure 14. Bootcamps projected market share over the next ten year.

Proposed assessment model

Finding a winner with the trends and market described in this brief will depend heavily on investment selection filters. Effective filters guide fund managers to the right opportunities.

Our proposed investment filters use three stages of assessment. We recommend that AP explores the usage of our proposed tool as part of their investment selection and filtering model.

At the first stage our focus is on assessing founder, segment, and scale fit.

5 of the 7 founders in our positive list had prior background and experience in the space they worked in. Bilal Hameed at Alt Academy taught chemistry for 20 years. Azib was a med-school student when he launched MedAngle. Haroon Yasin taught in schools across rural Pakistan before launching Taleemabad. Fahad and Anum both spent time in education services before starting EdKasa. Maheen and Leena ran a math lab for young children before starting Dot and Line.

	Assessment Level I	Assessment Choices		
	Founder Fit	**10**	**0**	**3**
1 Clarity	Does the team have a clear focus on a given segment?	Yes	No	Maybe
2 Focus	Which segment does the idea / team / business focuses on?			
3 Segment	Is the segment granular and well defined?	Yes	No	Maybe
4 Product Fit	Is the segment a good fit for this product?	Yes	No	Maybe
5 Team fit	Is the team a good fit for this segment?	Yes	No	Maybe
	Segment and Founder Fit			
1 Depth	How well does the team understand this segment?	Very	Not at all	A bit
2 Fit	Segment Motivation. Need. Want	Very	Not at all	A bit
3 Willingness	Segment Purchasing power and behaviour	Very	Not at all	A bit
4 Growth	Segment Growth outlook	Very	Not at all	A bit
	Scale Fit			
1 Scale	Can this idea scale?	Yes	No	Maybe
2 Step function	What are limitations and constraints of scale model?			
3 Capacity	Does the team understand this?	Yes	No	Maybe
4 Investor Fit	Would this be of interest to follow on investors?	Yes	No	Maybe
5 Scale	How capital and resource intensive is the scaling model?	None	Both	One

Figure 15. Proposed idea selection filters. Founder, segment and scale fit.

Segment selection and scale are two important predictors of success. Our second stage filter assess how well teams understand the segment they have picked and their path to scale.

	Assessment Level II	Assessment Choices		
	Monetization / Traction fit	**10**	**0**	**3**
1 Marketing	How credible is the plan to reach and convert customers?	Very	Not at all	A bit
2 Repeat	How likely will these be repeat customers?	Very	Unlikely	Maybe
3 Monetiztion	How strong is the incentive to purchase and buy?	Very	Not so much	Mild
4 Validation	If you were a customer would you purchase this product?	Yes	No	Maybe
5 Team fit	Would you purchase it from this team?	Yes	No	Maybe
6 Price fit	Would you purchase it at this price?	Yes	No	Maybe
	Growth Fly Wheel Fit			
1 Virality	Is a default viral loop built in the business model?	Yes	No	Maybe
2 Repeat	Is underlying product usecase a repeat purchase usecase?	Yes	No	Maybe
3 Retention	What is customer retention and referral strategy?	Clear	No	Not clear
4 Retention	How will the team handle high churn rates?	Clear	No idea	Not clear
5 Upsell	Is there a plan to increase average ticket size?	Clear	No idea	Not clear
6 Upsell	Is there an upsell path?	Clear	No idea	Not clear

Figure 16. Proposed idea selection filters. Monetization and growth.

A big reason for Alt Academy stellar start was their focus on A-level Chemistry. While 220,000[12] students take AS and A level exams across the world, 30,000 register for A level Chemistry. Bilal Hameed was able to take that small segment, dominate it with value, then use that traction to build a following that helped Alt monetize content across the world. Dot and Line started with a physical math lab for young children but when it came to scaling the business, switched to curated digital match making between tutors and students. MedAngle started as medical students helping other medical students succeed in professional medical examination. Rather than use their content and technology platform to target other related spaces, they stayed with the medical profession.

The questions focus on founding team's understanding of their path to monetization, traction, and growth, three drivers of success for founding teams.

Our third and final stage assess investor and stage fit for the proposed investment.

	Investment stage assessment	Assessment choices	
One	**Investment stage fit**	**10**	**0**
1 Stage fit	Is this an early stage deal?	Yes	No
2 Stage fit	Is this the first round of equity capital this business is raising?	Yes	No
3 Grant fit	Has this business raised grant funding before?	Yes	No
4 Age fit	How old is this business?	Less than 3	More than 3
5 Pivots	How many pivots has this business been through?	Multiple	None
6 Investor Fit	Would this idea be of interest to follow on investors in later stages?	Yes	No
	Business Model Assessment	**Assessment choices**	
Two	**Profitability fit**	**10**	**0**
1 Margin	What is planned profit margin per sale?	High	Low
2 Breakeven	How many units of sales are needed for breakeven?	Clear	Not clear
3 Scale	What share of the overall market is that number?	Clear	Not clear
4 Competition	How competitive is the market place?	Limited	Very
5 Moat	Is it likely to get more competitive?	Unlikely	Likely
6 Moat	Do prices need to drop for sales to go up?	No	Yes
7 Moat	Do planned margins need to drop for sales to go up?	No	Yes

Figure 17. Proposed idea selection filters. Investment stage and profitability

[12] https://www.cambridgeinternational.org/about-us/what-we-do/facts-and-figures/

Best bets for small funds with limited capital are early stage[13] (pre-seed and seed) rounds. Larger number of smaller checks are better than smaller number of larger checks.

Prior usage of grant funding is a double-edged sword. However, in our field interview dataset usage of grant funding in combination with early-stage deals, experienced founders, multiple pivots, the right segments, and traction worked well.

The ability to raise follow on funding rounds is another key predictor of success. Assessing that ability upfront is an important filter.

In terms of validation, source of above filters is analysis performed on teams in the positive list from our field interviews. We looked at common attributes that were common in at least 6 of the 7 teams. Any attributes that were also present in teams in the negative list were filtered out.

	1	2	3	4	5	6	7	8	13	
	AZ	EdKasa	Alt	D&T	TABad	MQ	MA	Product	Sum	Match with
Tracked attributes	24	19	16	24	25	18	18			Negative set
Local Focus	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**1**
Launch	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**7**	**1**
IP focus	1	1	1	1	1	1	1	1	**7**	**1**
Content Focus	1	1	1	1	1	1	1	1	**7**	**1**
Digital	1	1	1	1	1	1	1	1	**7**	**1**
Repeat Purchase	1	1	1	1	1	1	1	1	**7**	**0**
Customer Focus / arc	1	1	1	1	1	1	1	1	**7**	**0**
Acquisition channel - viral fly wheel	1	1	1	1	1	1	1	1	**7**	**0**
Founder Equity Tranche	**1**	**1**	**1**	**1**	**0**	**1**	**1**	**0**	**6**	**1**
Business Credits (AWS, Google Cloud, Azure)	**1**	**1**	**0**	**1**	**1**	**1**	**1**	**0**	**6**	**0**
International Focus	1	1	1	1	1	0	1	0	**6**	**0**
Pivot	1	1	0	1	1	1	1	0	**6**	**1**
Target segment - Teens	1	1	1	1	1	1	0	0	**6**	**0**

Table 10. Field interview candidate tracked attributes and matches with negative list.

The multi-stage assessment model is summarized below for quick reference.

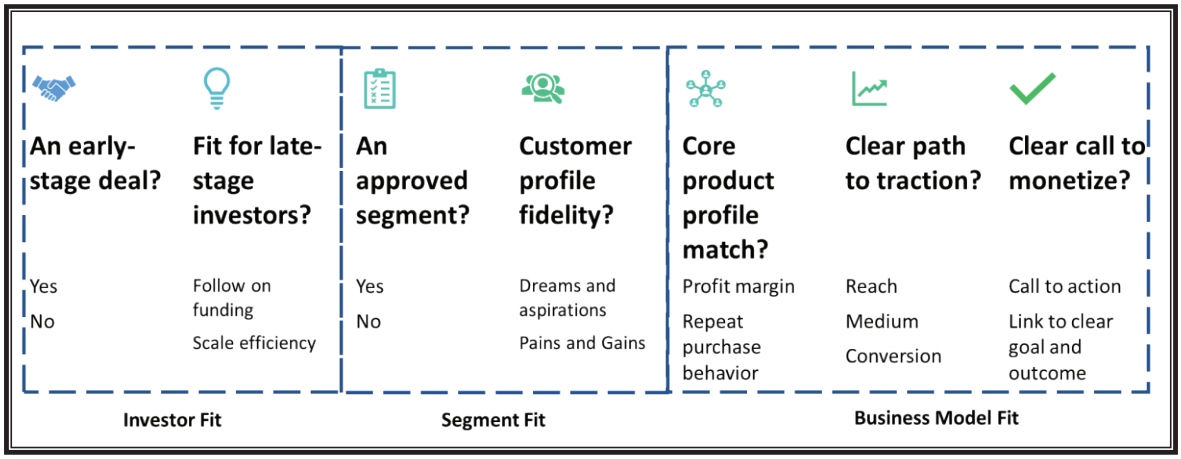


Figure 17. Proposed idea selection filters. Summarized framework.

[13] Clint Korver at Ulu ventures introduced the concept of Probability weighted Multiple on Invested Capital (PWMOIC) in 2017. His talks, articles and lectures speak base the argument for early-stage investments around the power law. See literature review section for additional detail.

We also rank additional opportunities beyond tapped and untapped pool shared above. Opportunities are differentiated using disruption, scale, funding, founder, distribution model and capital requirements.

Technology Management	Disruptive	Scale	Funding Type	Founder Type	Business Type	Capital Required	Distribution Model	Year to Breakeven
School management systems	Y	Y	Venture	Commercial	Software	High	B2B	5-9
Content management systems	Y	Y	Venture	Commercial	Software	High	B2B	3-5
Learning management systems	Y	Y	Venture	Commercial	Software	High	B2B	3-5
Content focused								
Subject Specific Video Lessons	Y	Y	Non Venture	Lifestyle	Content	Low	D2C	2
Subject Specific Test Prep	Y	Y	Non Venture	Lifestyle	Content	Low	D2C	2-4
Test Banks	Y	Y	Venture	Commercial	Software/Content	Low	D2C	2-5
Peformance benchmarking	Y	Y	Venture	Commercial	Software	Low	D2C	3
Skill Acquisition								
STEM School	N	N	Impact	Lifestyle	Lifestyle	Med	D2C/B2B	3
Science School	N	N	Impact	Lifestyle	Lifestyle	Med	D2C/B2B	3-5
Math School	N	N	Impact	Lifestyle	Lifestyle	Low	D2C/B2B	3-5
Co-curricular								
Career counselling	N	N	Self	Lifestyle	Lifestyle	Low	D2C	5
College counselling	N	N	Self	Lifestyle	Lifestyle	Low	D2C	5
Mental Health	N	N	Self	Lifestyle	Lifestyle	Low	D2C	5-7
Personal fitness	N	N	Self	Lifestyle	Lifestyle	Med	D2C	5
Extra-curricular	N	N	F&F	Lifestyle	Lifestyle	Med	B2C	5-9
Remedial								
One on one tuitions	N	N	Self	Lifestyle	Commercial	Nill	D2C	3
Group tuitions	N	N	F&F	Lifestyle	Commercial	Low	D2C	3
Hybrid tuitions	N	N	F&F	Lifestyle	Commercial	Med	D2C	3
School Systems								
Pre-Primary Prep Schools	N	N	F&F	Commercial	Commercial	Med	D2C	8-10
Primary Schools	N	N	Impact	Commercial	Commercial	High	D2C	8-10
Middle Schools	N	N	PE	Commercial	Commercial	High	D2C	8-10
Secondary Schools	N	N	PE	Commercial	Commercial	High	D2C	8-12
High Schools	N	N	PE	Commercial	Commercial	High	D2C	8-12

Table 11. Education services opportunities by funding, business, capital and distribution

Recommendations

The education services market is a hard market to crack. A cohort of incubated Pakistani education focused startup teams with young founders, tracked from 2015 to 2022 clocked **15%** survival rate over a 7-year observation period[14]. Only one in seven teams survived. Six failed.

Teams in the observation set were filtered, curated, screened teams that received mentoring, guidance, introduction, free space, digital ads, and server credits over a 3-to-6-month period. They had advantages ordinary teams dream of.

Capital, mentoring and incubation by itself is not enough. Idea selection filters matter. Segment selection matters. The value investors bring to the table matters.

There are two areas where AP's brings significant value to founder teams in the education services space based on its position within the AKDN network.

[14] Private unpublished study of incubated/accelerated pre-screened startups with young founders in Karachi, Pakistan.

I. Grant funding. This is not grant funding by AP, but assistance, guidance and direction provided to companies in the AP portfolio on grant funding applications from **non-AP sources**.

There is a tendency to look down on grant funding capital in venture circles. That shouldn't be the case. Grant funding is a necessary part of the product discovery and pivoting journey in the Ed-tech community. 5 of the 7 teams in our positive list raised grant funding. It is also a double-edged sword since 6 of 8 companies in the negative list also raised grant funding.

Given the association with social mobility and impact, there is significant grant funding available in the education, innovation, and technology space. This often leads to a mixed cycle of fund raising.

Founders raise external investment as well as grant funding for impact focused outreach that help them move product discovery cycle forward, validate effectiveness, create impact, and build traction in target markets without diluting equity.

Grant funding helps teams experiment with market outreach and product pivots. Dot and Line, EdKasa, Mindstorm Labs, AZ Corp, Sabaq, Wonder Tree, Chirag, Taleemabad utilized grant funding to explore product and market paths that would not be viable without it.

AP can play two roles here:

a) Open doors and active introductions to grant funding network.
b) Help startups and founders understand the grant funding process.

Using grant funding to step through the market and product validation ladder is not limited to the education sector. The largest micro finance bank in the country leveraged founder equity and grant funding to build its product portfolio and profile. Risk capital is a scarce product in emerging and frontier market. It doesn't matter what label it comes with, if it is available, investors should help founders get it.

II. Market validation and access to students and school systems.

Given the importance of time in an academic year, schools, teachers, and students don't want to experiment with new technology and materials unless it comes with a proven track record.

For startups in the Ed-Tech space this creates a different type of a challenge. One that deals with reach and access to customer base.

Given AKDN's extended network in the education space, it may be worthwhile for AP to explore formal channels of collaboration that can be used to facilitate these conversations.

For instance, minimum education benchmark and standards that a product must meet before it would be explore by AKES, AKRSP or AKU-EB projects for deployment in low-income schools and colleges.

Having that benchmark available on day one can save a founder significant time. Once they have a product that meets that benchmark the ability to have a friendly conversation with mentors in the network is equally valuable.

The requirement is not deployment in schools or payment for services, just engagement, guidance, and direction. Network to network these conversations are easier to arrange and execute compared to a founder trying to find the right resource.

Creating a formal process and channel that allows startups to explore these options is valuable. Just as valuable as similar channels that make it possible for teams to be aware of available grants in areas that overlap with their focus and interests. This can provide an important source of supplementary capital that can extend runways for many startups without creating additional dilution for shareholders.

We have two recommendations that are specific to AP and investment selection models.

I. Fund structure and segregation.

Given a limited capital base, AP may consider segregating investments and teams in three separate categories.

a) **Category A.** Ideas for impact.
b) **Category B.** Ideas with limited returns but not of interest to follow on investors.
c) **Category C.** Ideas that represent big bets on markets and of interest to follow on investors.

AP does not need to create three separate funds. The segregation can be handled internally within the fund at the investment allocation, bookkeeping and accounting level. However, two analysts teams would need to be earmarked. One for category A and B investments. One for category C investment.

For teams that fit AP's filters, the first check written by AP will never be enough. They would need to raise additional rounds, sooner, rather than later. Field interviews highlighted the extended funding life cycle experienced by many founders in the Ed-Tech space.

Category A and B teams should be directed to the grant funding route as early as possible. Category C teams should be directed to late-stage investor conversations. This guidance needs to be part of the post funding process. Even when teams have long runways, remaining runway needs to be monitored.

Why does this matter? Track record matters. A pure impact fund is assessed on lives impacted, not just returns. A pure venture fund is assessed on returns, not impact. Investment analysis and portfolio construction between impact and venture is different. One is focused on impact adjusted returns. The other focuses on risk adjusted returns. Both get better with practice, so it is important set correct expectations, practice the right skillsets and use appropriate tools within the two sub-funds.

By segregating performance on day one, AP will find it easier to raise a second venture fund after deploying its current capital commitment. When that time comes, segregated performance will determine how future fund-raising efforts are viewed by investors.

One can still measure segregated performance looking back at terminal date of the fund. However, without the right measurement and incentive metrics in place, terminal performance is likely to be muted.

What gets measured, improves. Without segregating performance, performance cannot be measured, tracked, or improved.

II. Segment selection.

Smaller markets are not necessarily bad bets. Bigger markets may not always be the best bets. Execution, focus, service quality and value delivered matters more than size of segment. The **secondary and higher secondary student market** represents only **11% and 22%** of private and public

student enrollment as shown in the figure below. Yet it is the segment where most ed-tech startups have found traction.

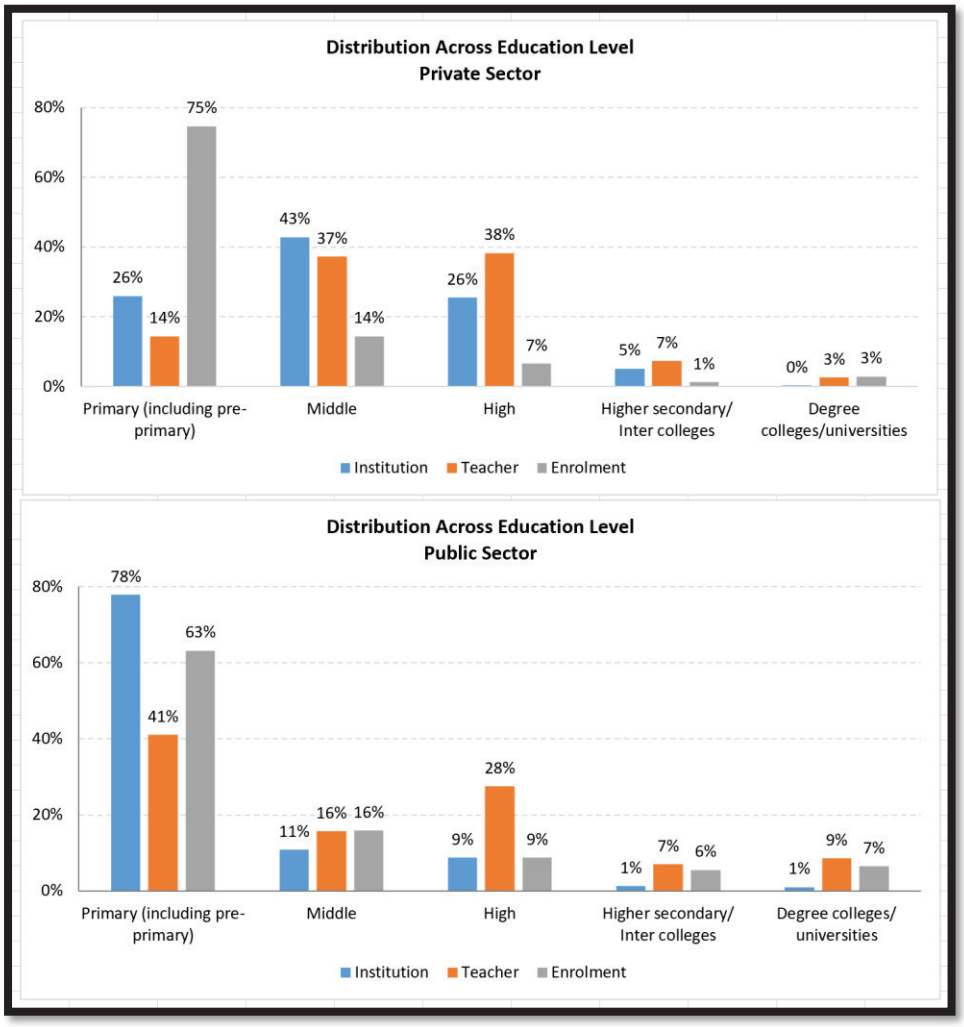


Figure 18. Student enrollment distribution across public and private sector by education level and grade.

Annexures

One. Methodology and process

The recommendations we make and investment filters we have identified are based on a series of field interviews carried out between August to November 2022 in the Education services space.

We reviewed existing research and datasets to size individual segments in Pakistan. We explored intersection of education and technology from a holistic lens, going back to the purpose of technology in education. We did this by speaking to two pioneers in this space who started off with computer-based training (CBT) in the early 80's. We looked at contemporary literature in knowledge economy and economic growth space. Beyond education technology we also spoke to small brick and mortar school system operator, low income school operators and our own experience with GEMS School System in the MENA region.

We collated our learning from field interviews using techniques inspired by qualitative content analysis (QCA) to identify any trends that would stand out. The QCA framework identified a few common themes within teams that had done well or were on the verge of significant break throughs. Some of these teams are also featured in case studies that supplement this document.

We used an initial literature and industry review focused on idea selection filters and venture investment models. Our objective was to identify lessons that could be applied to our proposed investment model.

Field interviews helped us formulate a view of the Ed-tech world and shaped multiple recommendations made above. Individuals interviewed included founders, venture investors, incubators, accelerators, academics, policy makers, development and impact investors and industry analysts. Initial interviews were used to build a baseline of target attributes and results. Later interviews were used to validate and refine the baseline. List of field interviews:

Game Jams. Boot Camps. • Yasser Awan. Mindstorm Labs. Cohort based. Zero to Hero.	**IP Monetization.** • Imran Azhar, AZ Corp. Video content monetization	**Hybrid Model.** • Maheen and Lina, Dot and Line. Subject specific remedial + Exam prep.	**Education sector Acceleration and Incubation.** • Jehan Ara, Katalyst Labs. Mixed set	**Education vs Learning.** • Zaheer Alam Kidwai, Education advisor to Hamdard University and Beacon House
Subsidizing Ed tech. • Hassan bin Rizwan, Sabaq + Moonshot animation. KG to Grade 5. Content	**Buyers outlook.** • Dr. Aamir Hassan, Habib University. 12+ buyers	**Academia** • Dr. Shakeel Khoja, IBA Karachi.	**Content. Video. TikTok.** • Fahad and Anum Tanveer, Ed Kasa. Exam prep	Grant funding. Past, present, future. • Javaid Malick, DFID, Malala Fund. Donor
Dev sector mindset. • Rahimuddin, Dev sector specialist. Policy	**Brick and Mortar.** • Sana and Asad, School owner. Physical school system.	**Outcome Focus.** • Bilal Hameed. Founder. Co-Founder. Cedar College. Alt Academy	**Hybrid Model** • Haroon Yasin. Founder. Taleemabad	**Outcome Focus.** • Rooshan Aziz. Co-Founder Maqsad
Pre-primary • Maira. Founder. Chirag	**Investment Thesis** • Khurram Zafar. Investor. 47 ventures. Investment Committee Insitor Impact Fund.	**Investment Thesis.** • Atif Awan. Investor. Indus Valley Capital.	**PE Operator.** • Narmeen Hassan, PE Investor, North American Ed-Tech specialist. Mixed set	

Two. Data Sources and references

Pakistan Education Statistics – 2017-2018

Published jointly by the National Education Management Information System, the Academy of Educational Planning and Management, and the Ministry of Federal Education and Professional Training, Government of Pakistan in January 2021.

Data use in the report is from the National EMIS databank compiled from several mentioned data sources mentioned. Limitations listed include:

- Private sector education data for Sindh and Baluchistan were based on estimation from the National Education Census (NEC) data collected during NEC 2005-06.
- AJK EMIS has provided private sector data.
- The current population census was conducted in 2017. However, as of the publication date the data of the population census was not released by the Pakistan Bureau of Statistics.

In addition to this, it may be noted that separate pre-primary institutions did not exist for the public sector of Pakistan. Admissions in pre-primary are given in the primary public sector schools. Hence, we have included pre-primary with primary schools for the analysis.

Deeni Madaras are tabulated separately in the report but included with primary. We have excluded Deeni Madaras from our analysis.

It may be noted that there is an ADB study published in June 2019 “School Education in Pakistan - A Sector Assessment”, that uses data from 2014-2015, 2015-2016 and 2016-2017 respectively. We have used the Pakistan Education Statistics study as it gives more recent numbers (2017-2018).

Annual Status of Education Report – ASER PAKISTAN 2019

Provisional report published by the ASER Pakistan Secretariat and facilitated by SAFED.

We have specifically used the report for estimating the market size for early childhood education and paid private tuitions.

Pakistan’s Middle Class. Chapter 19, Founder Puzzles, Jawwad Ahmed Farid, Aug 2022

A compilation of data from PSLM 2018-19, Pakistan census 2017 and a mapping exercise the link between education levels and income for Pakistan’s urban middle class. The study breaks down urban middle class households by income, age and education levels.

Three. Investment thesis

Our Ed-Tech investment thesis has four pillars. They are:

a) Pakistan's growing middle class. *Feeds the growth equation.*
b) Monetization and traction potential. *Linked to clear objective, outcome, or goal.*
c) Scale models. *Must have potential to scale. Cannot be a lifestyle business.*
d) Growth fly wheel. *Ensures future growth is greater than current growth.*

At a higher level an investment thesis helps us identify and filter ideas that are likely to do well. The four pillars above represent an initial model we use to present our view of the world. They describe why we think the Ed-Tech sector represents a promising investment opportunity.

The first pillar is Pakistan's **growing middle class**. Education remains a neglected sector when it comes to public sector investment. Beyond capacity building and infrastructure, there aren't enough credible public or private sector resources allocated to the sector. There are issues with quality, student and parental satisfaction, teaching effectiveness and learning gains with existing service providers. As demand for services explodes, incumbent players are likely to struggle with scaling up their offering.

The second pillar is **monetization and traction**.

A growing market is not enough. It must be a market where customers have the capacity and willingness to pay, and the product addresses a clear need or pain. We measure this dimension through the ability to convert prospects into paying customers.

Are there ideas and teams that have a better record when it comes to monetization and traction in the education space versus others? The answer is yes.

When the underlying product or service has a clear outcome, an outcome that delivers quantifiable value to customers, traction and monetization follows. When it doesn't, traction and monetization are hard, if not impossible.

Historically speaking outcome focused ideas deliver by committing and showing a path or a clear link to upward mobility, valuable skillset, higher income, better grades, and better futures.

The third pillar is **scale**.

We anticipate a demand push on account of a growing middle class but how will that demand be met? Technology could provide a possible solution but that depends on how it is deployed and used. Given our two-year Covid experiment with e-learning and technology tools in education, there is a strong push back from teachers and students when it comes to digital learning as the primary education tool.

Successful companies use technology in the right dosage. Outside of testing and assessment where the case for using technology to scale is strong, there are strong challenges to the thesis.

Remedial, supplementary, assessment and testing resources, technology gets a resounding yes. Guidance and mentoring, also possible. Async lectures and counseling, maybe. Primary exposure as a learning tool, as a viable alternate to mainstream schools and teachers, technology today gets a thumbs down from both teachers and students.

The fourth pillar is **marketing, distribution, exposure, and the growth fly wheel**.

If you want to reach out to large markets, especially students, there are only a handful of viable paths. One path is schools. A second is teachers. A third is classmates and peers. A fourth is tuition centers. A fifth is testing, assessment and passing exams in a specific subject or area.

If you could add retention and repeat purchases from customers to the mix, you could leverage all of the above, multiple times.

How? The right answer are products that fit in with customer life arcs. While customer satisfaction plays a role, a much bigger role is building products that fit in well with customer life and development arcs. Students in grade 8 will take grade 9, 10, 11 and 12 board exams. They will also sit for college and university entrance exams. In their first year of university, they will also struggle with the transition from high school to university standards. Build the right product and you have them as captive customers for 5 – 7 years.

Without repeat purchases and customer retention, one cannot activate the growth fly wheel. The growth fly wheel is a wheel that runs faster and generates more leads every time it completes a cycle. It does this by focusing on customer advocacy, product evangelism, repeat purchases and retention of existing customers.

Acquiring customers is difficult and expensive. Letting them go after a single purchase is wasteful.

Four. Education Sector Genotypes

Within an investment selection model there are descriptive parameters that deal with key dimensions that describe a business.

a) The quality of a business idea and its profit potential
b) Sector and segment specific parameters
c) Stage of investment

The primary profitability potential is often focused on drivers of the business model. Business models cut across segments and represent choices that have a direct impact on profitability and sustainability.

a) **Physical vs Digital vs Hybrid models**. Digital and Hybrid models have lower variable costs and are easier to scale. Physical models require more capital and capacity investment. Hybrid models have a higher chance of success. Pure digital models need a number of other parameters and design modifications to succeed.
b) **Scale vs size of market.** How big can the underlying market get? How easy is it to serve a given segment of the market versus the entire market? Are there step functions for scaling and reach that impact costs and profitability?
c) **Traction vs Monetization.** How easy is it to convince customers to try the product? How easy is it to convert customers from trial model to paying for a product or services?
d) **Retail vs Institutional**. Do we sell to consumers or organizations? Are customers or end-users individuals or institutions?
e) **Tangible and quantifiable value add.** Is the product or service proposition an instant get, or does it need to be explained? How easy or complex is that explanation?
f) **Needs and wants over tools and technology.** Is the product proposition centered around a valid need or pain point or focused on new technology, features, or tools?
g) **Purchase frequency, churn/retention, active customer shelf life**. These are determinants of Life-Time-Value (LTV) of customers. When compared with customer acquisition costs, they represent a powerful signal of future business survival and success.

Sector specific parameters, specific to education segment interact with business models parameters above. The dynamics between the two sets has a direct impact on future success and survival.

a) **Target segment.** Who do we sell to? Schools, parents, teachers, or students. How do we reach them?
b) **What are we selling?** Ideas with a direct link to aspirations and ambitions that open future doors do better than abstract and less tangible benefit and pain relievers.
c) **A focus on acquiring income generating, upward mobility skillset and assessment**. Monetizes better than any other focus, category, or segment.

Finally, the stage of investment decision differentiates between:

a) **Early stage.** Early stage is harder in terms of identifying, predicting, and modeling future success. Early-stage rounds are smaller and cheaper in terms of valuations. They also provide a more diverse and wider footprint. Early stage is often a numbers game.
b) **Late stage.** Late stage is easier in terms of predictive power. But more expensive in terms of valuations. Late stage is a filter game but returns are likely to be muted since the step up in valuations reduces future upside.

The parameters and their engagement above map directly into ed-tech genotypes. There are 5 genotypes that we review here. There are more variants, but we limit our coverage to ones that fit our investment thesis.

We segregate them based on usage and application.

The first two are directed at remedial or supplementary education. Resources that are used to improve performance and help a student achieve an acceptable passing grade in the subject they are studying. The **first** is age and grade focused. The **second** is subject focused.

The **third** is focused on better futures and income prospects through skill acquisition. Like the first two, this is also outcome focused.

The **fourth** is focused on passing specific certification or qualifying exams. The **fifth** delivers extra-curricular or co-curricular activities that are outside the scope of a traditional academic curriculum.

Beyond mainstream markets, there are smaller markets, niche markets, where scale is not always an option or possibility. The demand for services far outstrips the available capacity to service that demand. These are often lifestyle businesses with limited potential for scale.

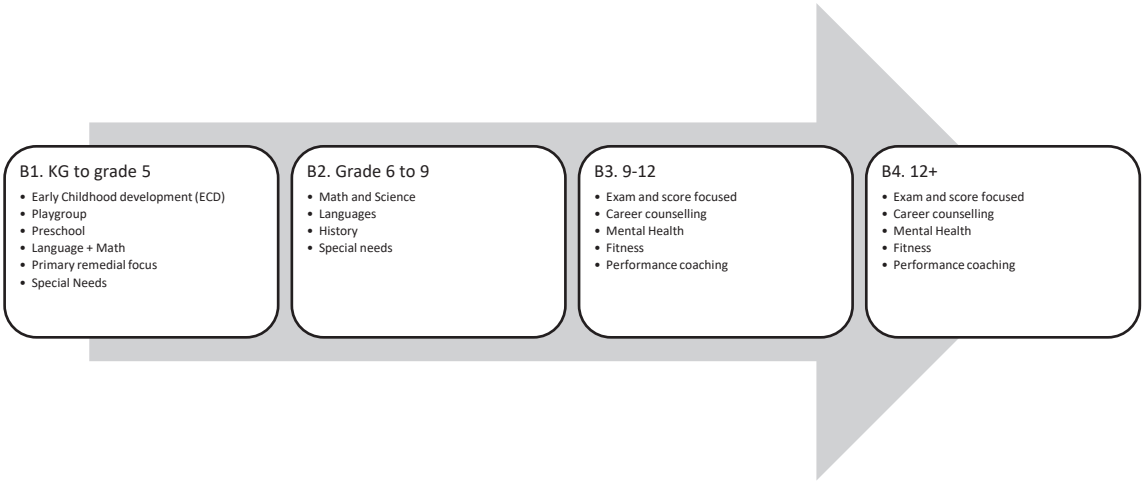
Teacher training, materials-based training, special needs therapy for language, expression, reading, writing, fine and gross motor skills, science, and math supplementary education for gifted children are some examples. These are often businesses that require a degree of specialization, certification and credentials, individual attention and engagement. Technology has a role to play in these businesses, but the constraint is often limited specialized resources.

While such businesses may represent an acceptable return on capital for owners and founders, they are generally not of interest to venture funds because of limitations on scale and capital. This creates a different kind of financing challenge when follow on funding is not available from mainstream investors.

The five Education sector genotypes identified above are expanded below:

- A1. Age and grade focus
  - Supplementary
- A2. Remedial
  - Supplementary
- A3. Skill acquisition and outcome focus
  - Income linked
- A4. Exam and Test prep
  - Certification linked
- A5. Extra or co-curricular
  - Personality development

A1. Age, subject, and grade focus



A2. Remedial only

C1. Grade 6 onwards.	C2. Primarily remedial.	C3. Past Papers. Auto scores.	C4. Subjects
•Digital •Tuitions •Tutor marketplace	•Pre and post Assessment •Direct Action •Supplementary Materials •Parental involvement •Self driven •Async vs Live	•Mixed format •Lectures •Exam Prep •Weakness identification •Test Prep •Adaptive testing	•Math •Science •Physics •Chemistry •Biology •Economics •Business Studies •Pakistan Studies •Islamiat •Urdu

A3. Skill acquisition and outcome focus

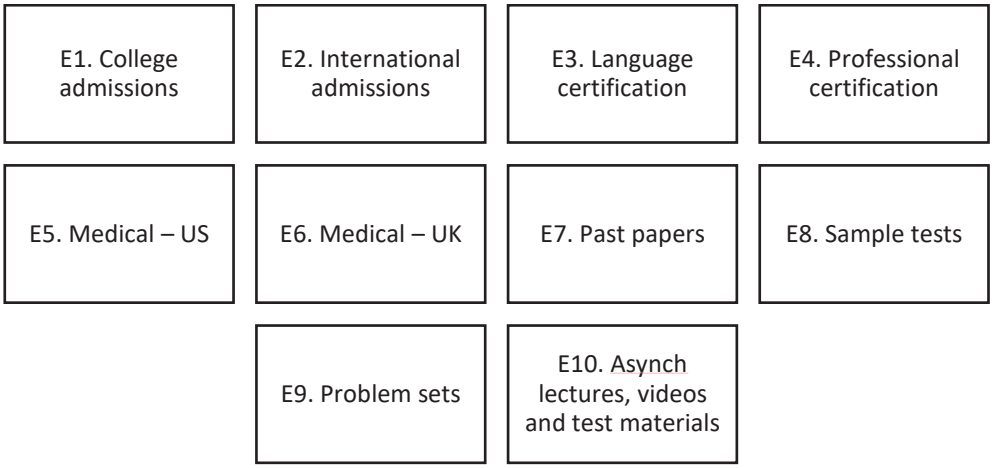
D1. Bootcamps

- Technology
- Modeling
- Animation
- Enterprise Stacks
- Cyber Security
- Ecommerce
- FBA

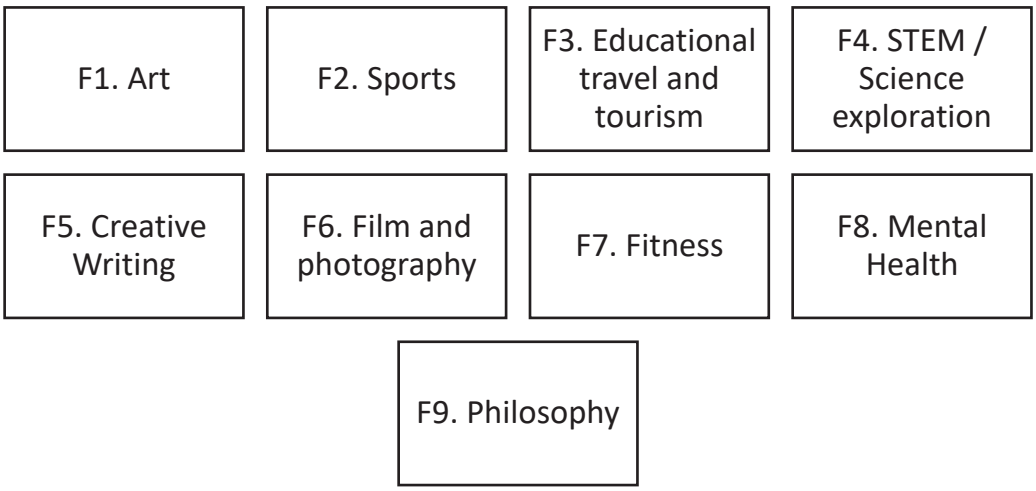
D2. Live cohorts

- Writing
- Design
- Technology
- Design thinking
- Product dev
- Zero to hero in 90 days

A4. Test Prep



A5. Extra-curricular and personality development



Five. Literature review and recommended readings

Class Clowns, Jonathon Knee, Columbia Business School Publishing, Reprint, 2020

The past three decades have seen dozens of otherwise successful investors try to improve education through the application of market principles. They have funnelled billions of dollars into alternative schools, online education, and textbook publishing, and they have, with surprising regularity, lost their shirts.

Although deep belief in the curative powers of the market drove these initiatives, it was the investors' failure to appreciate market structure that doomed them. Knee asks: What makes a good education business? By contrasting rare successes, he finds a dozen broad lessons at the heart of these cautionary case studies. *Class Clowns* offers an important guide for public policy makers and guardrails for future investors, as well as an intelligent exposé for activists and teachers frustrated with the repeated underperformance of these attempts to shake up education.

Key Lessons. Focus. Execution. Trojan Horse strategy. Teachers are key. Make teacher jobs easier. Business expertise over education sector expertise. Picking the right sector segment variable parameter combination. Content plays are expensive and no longer represent the right moat. Business model, traction, adoption, validation is important. Breakups over roll ups. Walled Garden fallacy.

Decision Analysis in Venture Capital, Clint Korver, 2017

Which process or model is better when it comes to venture investing? A shot gun approach that sprays and prays in early-stage deals or a feed the winner approach that starves and kills ventures and teams that fail to hit benchmarks and only allocates capital to winners in follow rounds and stages?

Clint Korver asks and answers this question in his lecture notes and Stanford University talk on capital allocation models and return patterns within the venture capital industry.

https://www.kauffmanfellows.org/journal_posts/applying-decision-analysis-to-venture-investing

https://medium.com/@clint_35018/why-data-and-metrics-should-matter-more-than-gut-in-the-vc-world-6e69c315d5da

https://medium.com/ulu-ventures/successful-vcs-need-at-least-one-outlier-to-have-a-well-performing-fund-c122c799dfb3

Where do good ideas come from, Steven Johnson, Riverhead books, 2011

The patterns of Innovation are Fractal, meaning that while mind creates ideas you can also zoom in and out from there to find other systems of idea generation, from the DNA through to the city.

The Adjacent Possible is the concept that there are only a finite number of next possible moves in any given environment. If we are in a palace, to explore the palace we must enter one room at a time - the exploration and advance may only happen one room at a time. We cannot open a door to a room on the other side of the building without first moving through the rest of the building in sequence.

Innovative Systems exist at the edges between order and chaos. They are not solid forms - ordered, rigid and static. Nor are they gaseous - chaotic, prone to disperse, easily disbanded. They are liquid -

able to shift shape, stay together, fit the shape of whatever container it is placed inside. Water is at once a powerful solvent and yet able to sustain life.

When creating ideas, Cultivation is more important than perspiration. Ideas tend to fade into view rather than simply appearing with a flash. That's why it's so important to have somewhere you can sustain and keep your ideas alive in the long term - they stand a greater chance of colliding with others idea you have or keep.

Openness and Connectivity are more important for the generation of ideas than competition.

Miss Excel and Ali Abdaal, Subject focused and Cohort based learning role models.

While it is hard to crack video and algorithmic codes, cohort-based learning centered around subject matter experts is a great fit for markets like Pakistan.

Extreme commerce Sunny Ali (https://aurora.dawn.com/news/1143724) may not be as big a role model as Miss Excel, Ali Abdaal or Write of Passage's David Perell but Sunny Ali represents an instance of where similar models have worked in Pakistan.

One reason / rational for including these names is to highlight the importance of media production facilities, access to fast bandwidth connections and mentoring and tutoring in basic production values. As well as the direct link between aspirations, goals and monetization

This space represents a different skill acquisition strategy. But it needs support nodes in media production that may help facilitate video/media/content teams to explore their own aspirations.

Miss Excel. Tik Tok. Role Model. https://www.theverge.com/22807858/tiktok-influencer-microsoft-excel-instagram-decoder-podcast

https://omr.com/en/daily/miss-excel-kat-norton/

https://www.thinkific.com/blog/miss-excel-online-course-tiktok-launch/

Ali Abdaal. Life Hacks. YouTube. https://mattthenomad.medium.com/how-ali-abdaal-gets-millions-of-youtube-views-1c70bbe20302

https://www.varsity.co.uk/interviews/23682

Byju. Financial meltdown. https://marketbrief.edweek.org/marketplace-k-12/byjus-releases-delayed-audit-report-showing-large-losses-2021/

Unacademy. India. Sales blowback. https://the-ken.com/story/out-of-options-unacademy-forces-teachers-to-sell-courses/?ref_sharecode=MTE0NzEzMi0zMDc2NjAtMTMwODAwNTgtYXBw

Dr. Tariq Banuri, Ex. Chairman HEC on quality in higher education.

Why does quality matter, how do we measure, sense or capture it and what is the right way forward to incorporating it within our teaching, education and learning models.

Implications for ed-tech startups. What is your purpose? To be a spectator or a participant? Sensing quality vs defining it.

Inspired by Persig's Zen and the art of motorcycle maintenance.

https://risktrainer.medium.com/on-quality-zen-and-the-art-of-motorcycle-maintenance-dac0adc29e0e

Why Information grows, Caser Hidalgo.

Knowledge. Our ability to predict, understand and work with events and processes. Know how. Our ability to perform a task without understanding mechanics or drivers. Information being distinct from meaning. Just because information is transmitted and received doesn't imply it was processed and understood. We use and need context to infer meaning.

For information to grow we process information and grow our collective knowledge base. Growth happens when complex social relationships make it possible for us to engage, interact, cooperate and share knowledge and know how across networks. An absence of trust limits networks we can engage with. We can only work with connected networks. Trust enables engagements that would be excluded otherwise.

Trust makes cohesive cooperation possible. The ability to work with partners we don't know or worked with before.

Complex products represent ordered information. To parse and solve complex problem we need knowledge and know how beyond limits of person or firm bytes. A person byte is holding capacity of knowledge within one individual. Firm byte is the same concept applied to a firm.

Imagine product market fit as a multi-dimensional search optimization problem. Every previously unconnected network you connect to the chain used for solving the problem improves ability to find the right solution. On your own, without that computational power, you will fail.

Annual Status of Education Report – ASER PAKISTAN 2019 (URBAN & RURAL)

Present analysis and findings from citizen-led (rural) and Pakistan Bureau of Statistics (urban) assessments and surveys carried out in 20 urban and 155 rural districts across the country. The surveys were conducted at the household and school levels and supplemented by visits to local schools.

The findings provide valuable information for parents, teachers, schools, and policymakers on the learning progress and educational outcomes of children in rural and urban regions. The report also evaluates other challenges such as overcrowding within schools. The report aims to identify areas for action and improvement.

School Education in Pakistan. A Sector Assessment. June, 2019. Norman LaRocque. ADB

Education service delivery up to grade 12 is a provincial responsibility. The focus of the report is Sindh and Punjab. Reviews constraints to education, and current and recommended strategies to address them.

Pakistan Systems Dynamics. June 2017. Andrabi, Tahir, and Isabel Macdonald. 2017

15 years of education spending and investments and policymaking have yielded disappointing enrolment and learning outcomes.

Education budgets have grown by 17.5% per annum since 2010. Punjab's education budget increased by 50% and 124% respectively for primary and secondary education. The government's education spending in 2016-17 was PKR 790 billion. For Punjab, the education budget was PKR 110+ billion and PKR 130+ billion for primary and secondary levels respectively in 2015-16. Punjab education funding per enrolled student in government primary schools in 2014 was PKR 21,101. Besides public school funding, the Punjab government also introduced a voucher system for private

primary schools which accounted for 10% of the total government spending on primary schools. Students of 1300+ private primary schools in 2016 are recipients of this voucher system where the schools are evaluated based on certain criteria such as student-teacher ratios and out-of-school-children new registrations.

Despite the increased spending, student enrollment has not seen a significant increase over the years of the study. For the age 5-12 year band, enrollment in Punjab increased from 71% in 2005 to 79% in 2014 only. The reasons cited are poor parents delaying admission until the child is 6 or 7 years of age and high dropout rates after primary school.

Private schools continue to outperform their public counterparts. However, overall, test scores and learning outcomes have been flat over the period of study with no significant improvement to speak off.

Pakistan -Learning and Educational Achievements in Punjab Schools (LEAPS).

Insights to inform the education policy debate. February 2007. Tahir Andrabi, Jishnu Das, Asim Ijaz Khwaja, Tara Vishwanath, Tristan Zajonc and The LEAPS Team

Increased enrollments between 2001-2005 particularly in the private sector (which has also seen an increase in the number of schools) have triggered opportunities for policy reform, equitable access, and improved learning outcomes.

The report presents the findings of a survey of 112 village schools in rural Punjab. This includes their learning outcomes, and the beliefs and behaviors of schools, teachers, and parents. The report highlights the strengths and weaknesses of the private and public sectors including resource allocation, costs, learning, and access.

Subjective versus Objective Incentives and Teacher Productivity – March 2022 - Tahir Andrabi and Christina Brown

The paper evaluated the impact of incentives on teacher productivity and student outcomes. It looked at both subjective and objective incentives. Subjective incentives were based on management (principal or vice principal) rating of teacher performance, while objective incentives were based on students' test performance. Finally, teacher productivity was assessed based on student outcomes based on test scores and socio-emotional development (love of learning, ethical behaviour, inquisitiveness, and global competency).

Management rating was based on certain evaluation criteria. Student-centered lessons tailored to students at different initial levels. Time spent collaborating with other teachers. Value addition. Improved classroom behavioral management. Assisting with administrative tasks. Helping plan after school events. Improved attendance.

Both subjective and objective incentives increased teacher productivity in terms of better test scores.