

# **A Comparative Overview of Mechanism of Educational Inequality in Relation to Patterns of Educational Inequality – India, China and Indonesia**

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DRAFT – DO NOT CITE WITHOUT PERMISSION

Word Count: 8,089

*Short Abstract: This paper reviews empirical evidence from intervention studies, in-depth field surveys, observational studies and results from qualitative survey findings in India, Indonesia and China with the aim of shedding light on mechanisms behind educational barriers, and comparing them to common patterns of inequality more commonly found in existing literature.*

## Introduction

Over the years, much of the in-depth work on educational access has focused on patterns of educational inequality in a particular country or region. For example, we have learnt that the availability and utilization of library books is associated with better performance for students in rural Indian schools (5 states in India - Bhattacharjea et al 2011); that none of the conventional teacher characteristics – education, experience, salary, gender - are associated with significant effects for student achievements of primary school children in rural China (Gansu Province, China - An et al 2007); that having teachers from local villages is associated with higher achievement scores (An et al 2007); teachers' score on teaching assessment is correlated with their classrooms' average test score (India - Bhattacharjea et al 2011); that differences between home language and language of instruction at school corresponds to lower attendance and lower test scores (India – Bhattacharjea et al 2011); that teachers with more experience may not be result in better student learning and achievement (for Gansu, China - Adams 2012; 8 provinces in Indonesia - Suryadarma 2006).

A handful of studies do explore patterns of educational inequalities across countries. From these, we have learnt, for example, that except for gender inequalities, educational expansion is less likely to erode barriers to social mobility such as inequalities related to ethnicity and socio-economic status (Hannum & Buchmann 2005; Filmer and Pritchett 1999; Filmer 2005); that in more developed countries, family factors mattered more for educational attainment whereas in less developed countries, school effects were more important for student achievement levels (also known as the Heyneman-Loxley effect) (Heyneman, S 1976; Heyneman, S & Loxley, W 1983); that schooling systems with better trained teachers have less dispersion in achievement (Montt 2011: cross national analysis of 56 countries); that teacher absence in developing countries is relatively wide spread across the teacher population of a country rather than occurring predominantly in a small number of recalcitrant teachers (Chaudhury et al 2006).

More recently, results from in-depth field surveys, observational studies, and intervention studies, have built up a body of literature that has allowed us to shed more light on the barriers to learning faced by children. One way in which these studies have 'done things differently' is to focus on sharper measures of educational inputs and outputs. In terms of educational outputs, studies/surveys initially (and sometimes still) focused on enrollment levels in schools<sup>1</sup> as the main measure of educational output. The realization that enrollment did not necessarily imply that children would attend school regularly, and even then, that attendance did not necessarily translate into (adequate) learning, has resulted in a shift in focus towards academic achievement/attainment, commonly measured by performance on math and language tests. This body of literature has been illuminating in understanding the state of educational attainment and the patterns of learning inequality. Another way in which our understanding of the barriers to education has been enhanced is through output measures that look deeper into factors that impede learning. These studies use, for example, output measures that relate to experiential factors such as the level of student engagement in class; willingness to attend school; sense of belonging to school; to what extent school helped to improve self confidence and ambition. As described in An et al 2007, these factors

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<sup>1</sup>Largely due to its relative ease to measure and the many political and international benchmarks set (e.g. MDGs) which used enrollment as a milestone.

are potentially important in their influence on children's future, on their persistence in staying in school and on traits that predict success later in life.

Shifting to educational inputs, commonly used input factors include teacher salary, experience and education, school infrastructure, parents' education, health. Developments in education research have introduced a focus on inputs relating to learning experience such as learning environment (whether student work is displayed in classroom), teaching pedagogy and engagement (whether teacher uses localized information to explain, whether the teacher is smiling with students, teacher interpersonal skills, does teacher encourage students to ask questions), home environment (how aware are children of the hardships their family faces). The former set of input factors do still matter for learning (in some cases), but where barriers to learning prove resistant to them, factors pertaining to the process of learning may help to reveal potentially ameliorable barriers, anomalies in observed patterns and help to shed light on the possible mechanisms operating behind educational inequalities. The sharpest of these studies use matched input-output data linking a child's outcome to class teacher factors, parent factors, community factors etc.

To different extents, China, India and Indonesia each face a number of issues which have yet to be rectified despite major education reforms in recent times<sup>2</sup>. In India, while enrollment rates have improved starkly, especially among girls in their early teens, high rates of teacher and student absenteeism, lack of disciplinary action meted out for teacher slackness, low levels of teacher competency and an education reform that focuses on infrastructural inputs rather than what happens within the classroom are just some of the issues the country has to contend with (Kingdon & Teal 2010; Bhattacharjea et al 2011; ASER 2011, 2012). In Indonesia, despite universal enrollment at the primary level, narrowing rural-urban disparities and more gender equality at higher levels of schooling, socio-economic gaps in education remain wide; measures such as cash transfers meant to ameliorate the socio-economic gap (e.g. Bantuan Siswa Miskin program) lacked coverage among those who needed it most due to loopholes in the allocation method; teacher absenteeism rates remain high while low levels of learning can be seen in poor test scores relative to international benchmarks. Moreover, inefficient resource utilization due to a decentralized financing system such as very low student-teacher ratios mean costs are high relative to achievement levels which remain low (World Bank 2012; World Bank 2010a,b). In China, while rates of transition from primary to secondary school in rural areas are increasing and secondary school enrollment is high on the whole, inter-provincial, intra-provincial, rural-urban and socio-economic gaps in education are still wide. The severe lack of educational provisions (and other social welfare) for children of migrant workers, especially post-compulsory schooling due to the incumbent *Hukou* system in addition to the lack of non-agricultural jobs for educated youth who lack of access to job networks are hurdles that need urgent attention (Connelly & Zheng 2007; Liang & Ma 2004; Chen & Liang 2007; Zhang & Zhao 2003). The educational attainment of a population takes time to modify which underscores the importance of early intervention to upgrade education systems and mitigate any unintended negative run-off impacts on the next generation.

### **Framework**

Increasingly, governments are implementing measures to remove private costs of accessing basic education. However, opportunity costs of attending school remain high, and non-cost barriers are

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<sup>2</sup> See Jones & Ramchand 2013 for a more detailed outline of education challenges in these three countries

likely to continue to affect student persistence in attending school and influence learning levels in classrooms, which determine whether universal basic education and more importantly functional literacy can be achieved. Gaining a better understanding of the mechanisms operating behind educational inequality, in combination with what we already know about patterns of educational inequality, can help in understanding what makes certain interventions effective in achieving their desired outcome, and why some may not, even though they seem to be doing what is prescribed. This is especially important in resource constrained environments (limited access to physical resources in rural areas, and limited amount of government funds that can be pumped into rural basic education).

### **Scope of Papers Reviewed**

This paper takes the results from a number of in depth surveys, observational studies (micro empirical evidence), field interviews conducted in China, India and Indonesia, and attempts a cross-country comparison of their findings. Comparisons are made between findings that reveal patterns of educational inequality and those that unravel possible mechanisms of educational inequality. A bulk of the studies reviewed here focus on rural areas and regions, on basic education (mostly at the primary level, some include lower secondary), and on common, everyday factors that children encounter in their daily schooling and learning. These include factors related to school, teachers, family and community. The choice of countries covered is twofold: first, for institutional alignment with the centre I work at; second, it builds on an earlier study which examined key issues hindering educational access and achievement in these three countries (Jones & Ramchand 2013); however, this overview could easily be extended to other developing countries which have the relevant data. Many other dimensions of educational inequality in education e.g. ethnicity, disability or health, are not dealt with in this study but can be analyzed in a similar way.

## **Inter-country Comparisons**

### **1. Learning Environment**

By far the most important factors cited by the various studies which spurs children to attend school and encourages them to learn have to do with the nature of the learning environment they are in. In an Indian study which encompassed ~29,000 government primary school teachers in rural areas in ~1,700 classrooms within 5 states, Bhattacharjea et al (2011) find a strong positive relationship between mean and median classroom test scores of standard 2 and 4 children and child friendly indicators. Six indicators of 'child friendly learning environment' were used in their study: 1) Did teacher smile, laugh, joke with at least some students? 2) Did students ask teacher questions? 3) Was children's work displayed in the classroom? 4) Did teacher use local information to make academic content relevant? 5) Did the teacher use any teaching and learning material (TLM) other than the textbook? 6) Did the teacher ask children to work in small groups or pairs? In fact, test scores increased steadily as the number of child friendly indicators observed increased. The table below presents their results from tests administered on standard 2 children:

Child friendly indicators and test scores: Std 2

Classroom indicator	Std 2 classroom baseline score (%)					
	In classrooms where indicator = 'Yes'		In classrooms where indicator = 'No'		Difference ('Yes' - 'No')	
	Mean	Median	Mean	Median	Mean	Median
Children's work displayed in the classroom	47.8	47.0	41.6	42.0	6.22	5.00
Teacher smiles/laughs/jokes with students	48.4	48.0	41.6	42.0	6.81	6.00
Teacher uses local info to make content relevant	47.0	47.0	42.0	42.0	4.99	5.00
Teacher uses TLM other than the textbook	50.5	53.0	42.0	42.0	8.41	11.00
Teacher asks students to work in small groups	45.5	46.5	42.7	42.5	2.80	4.00
Students ask teacher questions	47.1	48.0	41.6	41.0	5.49	7.00

Source: Bhattacharjea et al 2011 p. 45

To read further into the results, one finds that the strength of relationship varies across indicators and across grades: largest difference seen both in std 2 and 4 were in classrooms where teacher observed using teaching and learning materials other than textbooks. The same study found that 60% of teachers indicated that the most important factor that influences children's learning is that 'Children should have a friendly relationship with the teacher'. Sadly, 38.7% of classrooms displayed zero of the 6 characteristics while only 8.9% of classrooms displayed 3 of the 6 characteristics and 0.6% had all 6; only 25.6% of standard 2 and 27.8% of standard 2 and 4 classrooms respectively had children's work displayed, while only 29.7% of standard 2 and 28.6% of standard 4 classrooms had teaching and learning material other than textbooks visible. From teaching questionnaires, the study found that teachers are aware of the importance of conducive, friendly and positive feelings in schools and classrooms, however few of them put this into action. In part, this could be due to the system in Indian schools which focuses more on whether the teacher is able to get through the syllabus specified in textbooks rather than whether the mode of teaching is effective, and the Right To Education (RTE) Act which specifies a list of requirements which schools should have, of which the above mentioned 'child friendly characteristics of schools' are not included.

In the case of China, a longitudinal study of more than 800 children between 2000 and 2007 in Gansu Province (one of the poorest provinces in the North West of China) found that students reported significantly less psychological stress related to schooling in 2007 compared to 2000 following a widespread overhaul of teaching styles and curricular material in Chinese schools as part of the country's 'New Curriculum Reforms' (known as 'SuZhiJiaoYu') which required schools to implement a more holistic approach to teaching where the learning environment is open and participatory and to step away from the traditional model of rote learning (Adams and Sargent 2012; Dello-Iacovo 2009). Changes introduced included new textbooks which were more interactive and relevant to students' lives, new teaching methods in which teachers were asked to use more praise and encouragement with students rather than punishment and more group work rather than rote learning. As with any widespread reform, these measures would take time to be implemented and even then may only be partially used in day-to-day teaching and learning<sup>3</sup>. Using various model specifications, Adams and Sargent (2012) found that students who reported encouragement to ask questions and having animated discussions with teachers have higher levels of student engagement and lower stress levels. Student engagement was measured by the extent to which students agreed with six statements about attitudes to school: 1) I am happy at school, 2) I like to participate in class,

<sup>3</sup> Unfortunately the paper does not provide data on the proportion of schools which were employing these child-friendly practices.

3) I do not want to go to school, 4) I often feel bored at school, 5) I enjoy learning, and 6) If I work hard, I can do well. In a related study also in Gansu Province, researchers found that students who report that their class teachers treat students fairly were found to perform better in language and math tests administered, net of prior achievement (An et al 2007). Though the measurements are slightly different from the Indian study, it is evident that the softer aspects of learning are just as crucial, if not more important, than the more visible aspects of school when it comes to learning and acquiring knowledge.

Patterns across countries may not always be straightforward. Returning to a point made in the previous paragraph on learning material other than textbooks, the study by Bhattacharjea et al (2011) in India finds a strong relationship between availability and utilization of library books and test scores – steady improvements were found in test scores of students who had no access to library books in school, to those with library books available but not seen utilized, to those with library books available and seen utilized. The key difference here is the increment in scores between library books being available but not utilized, and being utilized. In an Indonesian study, Suryadarma et al 2006 find that having a library available school has a positive relation with math and language scores in the quartile analysis specification, while in the OLS and IV specifications, having a library had positive but insignificant relation with math score, and negative but insignificant relation with language score. Whether library books were utilized by children was not measured in this study making it hard to compare. Could it be that the effect on test scores from having available library books is working through other inputs? Or is their availability not strongly related to test scores? Or could the relation be spurious.

While these findings are illuminating in understanding the situation ‘on the ground’ and whether various factors correspond to improved outcomes, it still begs the question of mechanism – ‘What was it about the intervention [or input factor] that triggered what kind of change (Khemani 2012)?’ In the study by Bhattacharjea et al 2011, that question would be: what is it about having students work displayed in the classroom or using teaching materials other than the textbook that made students in that class perform better than their peers? In other studies, that question would be: what is it about having a younger teacher or a teacher from a local village that engendered higher performance? Unfortunately, there is far less clarity on this, especially in the scope of experimental evidence that would allow for a more conclusive answer.

Some studies have attempted to address this gap through qualitative measures of the reported experience of key ‘agents’ involved, and then quantifying them. While these studies do not claim to establish mechanisms with certainty, the evidence they find is suggestive of possible mechanisms that could exist, and brings the literature one step closer to deciphering this puzzle. For example, a study based on the Gansu data found that students who report teachers care for them and treat students fairly and encourage questions are likely to have higher educational aspirations. The same study also found that students who indicate their teachers listen to them, care for them, and treat them fairly report higher levels of academic confidence (An et al 2007). Perhaps this is due to the way in which children retain and process information. Friendly-learning practices such as smiling in class, joking with students, encouraging participation and questions etc. may arouse feelings of connectedness, being cared for, and a sense of belonging in students, which is linked to greater student interest in school, more engagement in what is going on in class and better psychological well-being (Klem & Connell 2010; Wentzel 1998; Good & Brophy 1986) which are positive for

learning.

## 2. Teacher Experience

Conventional wisdom would have that a teacher with more experience would be a more effective educator than one with less classroom experience due to familiarity with the syllabus and skills he/she has picked up along way in teaching and managing various classes. We see this embedded in pay structures of many school systems and in studies which hypothesize a positive relation between teacher experience and student test scores for instance. The data however, shows a far more complex pattern.

A study by Zhao & Glewee (2009)<sup>4</sup> in Gansu province finds that for lower secondary students, the proportion of teachers with more than 5 years of teaching experience had a significant positive impact on the number of years students stay in school. However, for primary schools, teacher experience was generally insignificant and negatively correlated with experience. A study by Brown and Park (2002) covering six provinces in central and western China<sup>5</sup> found that the number of years a child stays in primary school is negatively related to the proportion of teachers with post-secondary education. These studies bring up the questions whether it is possible that less experienced teachers who tend to be younger, more energetic and enthusiastic, are better able to motivate primary students, a factor which is likely to be more important for primary school teaching than more experience. On the other hand, teaching secondary school material may require deeper understanding of the more advanced material and familiarity with the syllabus to teach it more effectively and this may increase with experience.

Zooming into teacher experience dynamics at the primary school level, using data from primary schools in Gansu Province in China, Adams (2012) finds that students of teachers with 0-2 years of experience have similar mathematics score to those whose teachers had 10+ years of experience and that among the children sampled, this group had the lowest scores. Next higher scores were by students whose teachers had 6-10 years of experience. The highest scores came from students taught by teachers with 3-5 years of experience. The author linked this to the context of limited and low paying rural labour market opportunities in rural China where teachers face conditions such as difficult living conditions, low and late salaries, few opportunities for furthering their own education. The most effective teachers are able leave poor rural schools for better ones in townships and counties once they have some experience, and thus the achievement drop in students taught by teachers with 6-10 years of experience compared to 3-5 years of experience may reflect the attrition of the most effective teachers who are able to get jobs elsewhere after 5 years of teaching experience (Adams 2012).

The situation with the most and least experienced teachers remains to be answered. While on one hand experience increases the ease at which teachers could do their job, the flip side of it is that the teachers with the most experience could possibly be those who never earned the chance moved out; or they may have close ties to the community and therefore stayed on; it could be least effective teachers are assigned to teach lower primary since it is believed to be 'easier'; or that more

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<sup>4</sup> Using data collected in 2000 and 2004, covering 1918 primary and secondary school children.

<sup>5</sup> Using Household survey data from 1997

experienced teachers are older which could be linked to using old teaching styles, which are less 'student-centered'.

Looking at Indonesian rural Junior Secondary school, Takahashi (2011)<sup>6</sup> finds that teacher experience was significant for enrollment in junior secondary school in 1993 and 2000 but not significant in 2007 once junior secondary education became nominally free for these students in 2005. A study by Suryadarma et al (2006) found a more complex dynamic: in their sample of grade four primary students, average experience of teachers has positive relation with math scores but slight negative relation with language scores in the quartile regression specification; using the IV and OLS specification, average experience of teachers had an insignificant negative correlation with math and language test scores while average experience squared had an insignificant positive correlation with math and language scores. Indeed, the relationship between teacher experience and test scores is not as straightforward. Could the lack of significant relationship in the IV/OLS specifications imply the lack of impact of teacher experience at the primary school level where teaching style may have a greater impact on test scores than teaching experience? Or could teacher gender play a part? The same study finds that the proportion of female teachers is uncorrelated with performance of females students but correlated negatively and significantly with male student performance in math. This could go some way in explaining why the relationship with math scores was positive in the quartile regression but insignificant in the IV/OLS model, though the findings in this sample are in contrast to the majority of studies which find that female teachers are more effective teachers in general.

While experience builds familiarity with the syllabus taught, experience may also be linked to older teaching styles which are less participatory and less student-centered. Teachers who have been teaching in a particular style for many years would find it hard to undo deeply-engrained teaching practices, many would also have been taught in that way as students. This is made more difficult as teachers (in all three countries, to varying extents) have been encouraged to alter their teaching styles to be more 'student centered'. Pre- and in-service training is often believed to help teachers make this transition, however, various studies found that during these workshops, training leaders simply re-stated information from teaching manuals and failed to include training on instruction methods which teachers were being encouraged to adopt, much less exemplify them (Bjork 2013); courses assumed that teachers faced a homogeneous class of learners and adequate infrastructure and teaching materials when in reality, teachers needed to learn techniques to cope with the realities of conditions that prevailed in their schools (Ramachandran et al 2008). Added to this, teachers' ideas of what constituted participatory/student-centered teaching methods were often times not actually student-centered (Bjork 2013).

In trying to understand the relationship between teacher experience and student learning, the commonly held belief of positive relation with diminishing marginal effects does not always hold true. The complexity of the patterns can sometimes be deciphered by finer measures which reveal finer patterns, at other times it forces one to ask what it is about teacher experience that can lead to (or not lead to) better learning among students in different contexts.

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<sup>6</sup> Uses data from Indonesian Family Life Survey, National Socio-Economic Survey (SUSENAS), Village Potential Survey Podes. in 1993, 2000 & 2007. Measure in question is enrollment. Sample consists of secondary school aged children. Sample was restricted to the rural population.

### 3. Teacher Absence, Nature of Employment, other Teacher Characteristics

*“Teacher attendance is not enough for student success, but teacher absence has a negative impact on students<sup>7</sup>”*

In a six country study on teacher and health worker absence (Chaudhury et al 2006), the authors find that teacher absence rates average at about 19% (unweighted) with India primary school teacher absence rates at 25% and Indonesia at 19%<sup>8</sup>. The study goes on to point out that factors such as gender, locality, infrastructure, monitoring show correlations with absence: female teachers, local teachers, schools with better infrastructure and being closer to the ministry of education associated with better attendance. Teachers who were not classified as having a ‘full teacher’ status’ had a slightly different attendance patterns in each country.

Zooming into individual countries in question, the literature on India finds that within schools, teacher attendance varies significantly by teacher type: contract teacher (known as Para Teachers in India) attendance was 78% compared with 69% for regular teachers (Bhattacharjea et al 2011). In a study focusing on one state in India<sup>9</sup>, Muralidharan (2010) finds that contract teachers (normally hired on annual basis and having fewer non-teaching responsibilities than regular full-time teachers) tend to be female, typically live in the same village as where school is located, tend to be younger, less likely to hold a college degree or a teacher training certificate and are paid less than 20% of regular teacher salaries. In addition to the contract/regular teacher separation, there is a distinction between private and public primary schools in rural India, with fee-charging private schools<sup>10</sup> typically displaying higher teacher attendance and higher test scores.

In Indonesia however, part-time/contract teachers were found to have significantly higher absence rates compared with teachers with full-time / civil servant status. This is surprising since one would think that contract teachers would want to work harder to elevate their chances of moving to full-time teacher which pay much higher. Private school and public school teachers were also found to display similar rates of absence (public – 19%; private – 18%). Among absent teachers, roughly 55% did not have a valid reason (arrived late/left early/don’t know/absent without permission/no rationale given) (SMERU 2004).

While contract teachers face significantly lower salaries in both countries, digging deeper, we see that different processes are at play. In India, high unemployment rates are a driving force for rural youth to take on the contract teaching jobs in spite of the lower income relative to their full-time peers. Head teachers are more likely to be able to take disciplinary action against shirking para teachers than shirking regular teachers since most regular teachers are unionized (Kingdon &

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<sup>7</sup>A study by Duflo et al (2010) provides experimental evidence from the state of Rajasthan in India of the impact of teaching attendance on student learning: every 10 %pt reduction in teacher absence raises student learning by 0.1 standard deviation.

<sup>8</sup> Quite shockingly, primary medical workers had average absence rates of 40% in both India and Indonesia according to the study, and 35% across the six countries. The other four countries are Bangladesh, Ecuador, Peru, Uganda.

<sup>9</sup>Andhra Pradesh. (drawing on the Andhra Pradesh Randomized Evaluation Studies)

<sup>10</sup>There is a further subdivision into Private Aided and Private Unaided schools, though for the purpose of the point made here this distinction does not have an impact.

Muzammil 2001; Muradliharan & Kremer 2008; Ramachandran et al 2008). The result is higher attendance among para teachers. In Indonesia, contract teachers supplement their lower salaries with work in other places (teaching other schools, farming, store keepers) in order to earn sufficient income for their livelihoods and teacher fatigue is believed to be a key reason for absence. For those who do aspire to full time teaching roles, they would still need to follow the regular civil servants' recruitment and examination procedures little different from what other applicants without teaching experience would go through (SMERU 2004), which does not provide sufficient incentive to work hard on their contract teaching jobs.

Evidently, poor monitoring, availability of alternative employment, and a lack of incentives and disincentives do have a part to play in the problem of lackadaisical teachers. But various questions surface in trying to understand how this situation arises. Do teachers start their career shirking? Or do teachers start off enthusiastic, but get demoralized over the years? Does peer influence have a part to play, or realization that the best outcome option is to 'game the system'? One study from India (Ramachandran et al 2008) delves into the day-to-day lives of teachers, in particular anecdotal evidence from interviews with teachers to better understand the "conditions [which] reflect the reality, as opposed to the theory, of 'teacher development in India" (ibid p.7). While some teachers are just 'bad grapes', the study finds: a lack of proper selection mechanism in hiring teachers – though required to have a 12th standard qualification, aptitude is never screened for in spite of common knowledge that many students do not reach grade level competency; few or no sources of support within schools from existing teachers; little done to prepare selected teachers to delve into the educational process – much of the training received and tested in teacher training courses is theoretical which is limited in helping them handle real-life classroom situations; a system which misaligned incentives - student performance has no influence on rewards while teachers soon learn that time and effort spent keeping politicians and elite members happy does lead to rewards (e.g. moving to more desirable school). Most importantly, teachers are likely to teach students as they were taught unless incentives and opportunities are provided to undo this and learn new teaching techniques and construct a different concept of how they can make their teaching interactive, participatory etc.

How does all of this impact on student performance? The answer varies. The study in India by Bhattacharjea et al 2011 finds that teacher age, gender, educational qualification, training, and whether they are contract or regular teachers do not have a visible effect on performance of their students. Also in India, Atherton and Kingdon (2010) find that contract teachers with similar observed characteristics to full-time teachers produce higher student learning for a much lower cost<sup>11</sup>. In the Indonesian case, Suryadarma et al (2006) finds that schools with higher teacher absence have lower performing students; digging deeper, they find the negative relationship is significant with math scores, but insignificant relation with Indonesian language scores. The authors postulate that this might be because students can learn language from parents or by imitation when communicating with people, but a teacher's guidance may be required in acquiring math skills and understanding logical process in solving sums as students are less likely to engage in rigorous mathematical problem solving on a daily basis outside class. The same study in Indonesia finds a significant negative relation between proportion of permanent teachers and math scores, but an insignificant positive relation with language scores. Possible explanations for this include: Permanent

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<sup>11</sup>Regional variations in the source of data could play a part in the differences in conclusion

teachers, having been through training and certification, and more likely to be able to know ‘how to teach’ which is more important for understanding how to solve math problems than language questions; permanent teachers with secure jobs work less hard but the lack of effort impacts math scores more due to the lack of students encounters with solving math problems in daily life. The Indonesian study also finds that schools with higher proportion of teachers with second job (likely to be contract teachers) is negative and significantly related to math score and negative but insignificant with language score. Teacher fatigue could play a part here.

Again here, we lack a comprehensive understanding of what are the likely mechanisms that might be dominant in each context. Studies which hear from teachers what motivates them for example, may be helpful in finding effective solutions that focus on creating incentives and dis-incentives to elicit effort from teachers. Using salaries as the only tool is limited in its efficacy and is unlikely to be a viable solution in the long run.

An aside on the situation in China: While temporary teachers (known as ‘Daikē’ teachers) are also used to supplement the lack of full-status teachers (known as ‘Gong Ban’ teachers), the non-mention of teacher absence in the literature seems to suggest absence among either group, is not a major issue. However, the status of Daikē teachers is somewhat more controversial in China than Indonesia or India. Despite national efforts to eliminate Daikē teachers and employ only Gongban teachers, new Daikē teachers are still being employed in some parts of China, especially rural areas (although the overall number of teachers has reduced). While some Daikē teachers do not have the full set of qualifications, others who are fully qualified are not given Gongban teacher status due to budget limitations. Some remain as Daikē teachers for extended periods of time. It is also not uncommon for both types of teachers with equal qualifications but different pay to work in the same school. (Sargent & Hannum 2005; Robinson & Yi 2008)

A study on the role and status of Daikē teachers in one western province found that they tended to be slightly younger, have less teaching experience and were more recently appointed. 65% of sampled Daikē teachers were qualified to work as Gongban teachers but were underemployed likely due to local financial constraints. Their salaries were roughly 20% that of Gongban teachers but had similar teaching loads (Robinson & Yi 2008). The study found that a variety of perceptions were held about these teachers, ranging from ‘saviors of the school system’ to ‘an embarrassment’. Interviews revealed that perceptions of these teachers were that they were a hardworking group with their motivation coming from the hope of eventually gaining Gongban appointment or, in the case of those from local community, feelings of contributing to their community’s development. On the other hand, some Gongban teachers saw Daikē teachers as an underclass, lacking education or qualification (Robinson & Yi 2008). In surveying the literature, I did not find studies which linked student performance to teacher status in China.

#### **4. Family/community characteristics [Delete]**

## Final part

### With all this data is out there, why is so much of it Not being acted upon?

While this paper does not seek to answer this question, looking at the various studies cited, it is one that inevitably comes to mind. The literature does provide some plausible reasons. Resource constraints are an obvious and major reason (e.g. qualified Daike teachers not being paid Gongban salaries in China), and related to that, the political will to re-direct financial and other resources away from competing priorities. Another possibility is what is termed “isomorphic mimicry” where existing school systems gained legitimacy, support, and are rewarded for “looking like” good schools rather than actually promoting learning (Pritchett, Woolcock, & Andrews 2010; Pritchett & Beatty 2012; DiMaggio & Powell 1983). These school systems emphasise process compliance and inputs rather than focusing on the reality of teaching and learning and to get around this, “The practical question is therefore how to sabotage the camouflage so that systems are motivated to adopt innovations” (Pritchett & Beatty 2012 p. 49). Yet another reason could be that learning is not always translated to getting better jobs in many regions, which reduces motivation to change the schooling system. Educated workers may move into ‘socially unproductive’ jobs ; or due to a lack of expansion in industries that require more advanced skills, there could be a limited demand for educate workers, thus providing little impetus to change (CFGD 2013).

### Limitations

The majority of studies reviewed in this paper focus on rural areas, particularly the studies on India and China. These areas tend to have higher prevalence of disadvantaged populations and have been targeted by research groups resulting in a body of studies that utilize rich data (e.g. matched-student-teacher-family-community data; longitudinal data; randomized controlled studies). However, children in urban areas who fall into lower socio-economic brackets also face a web of barriers to schooling and learning which may be different from the ones mentioned here. These groups have not been the focus of this paper. For example in China, children of floating migrant workers who originate from rural areas but live in urban areas face hardships such as poor infrastructure and a lack qualified teachers if they study in migrant-sponsored schools while those who get admission into public schools face high fees, discrimination and ridicule by local classmates and suffer from a sense of inferiority (Chen & Liang 2007; Zhang & Zhao 2003; Irwin 2000). Assuming that children in rural schools have it worse than that of urban children is not always true.

Studies on basic education, especially primary schooling, formed the bulk of material reviewed in this paper as it provided a meaningful source of comparison between the three countries which are at different stages of educational development. However, in studying patterns and mechanisms, what we observe at the primary school level may not apply at the secondary school level or at higher levels. Expansion of education at different levels requires different inputs to be effective. Using the example pointed out earlier in this paper, there is some evidence that one of the more important ingredients in primary teachers is enthusiasm whereas to teach secondary school a teacher’s content knowledge is more important.

Each study employed different measures and used different estimation techniques. Thus, their findings are specific to a certain context and caution exercised in applying them elsewhere. For example, some studies which started before schooling became free for certain groups and explored cost barriers would find very different conclusions after once schooling became free. While their results may not be as useful in context after the reforms, they are nonetheless just as insightful in learning how patterns change (or do not change) and what factors come to the fore when there are major changes to binding constraints. Herein lay the difficulty of this paper- presenting the various findings in a way which could still be meaningful.

As with every such study, anomalous findings and patterns which did not 'fit in' came up in the literature. There was not sufficient space to address all them, but for those that were drawn upon in this paper, it was interesting to see them alongside findings from other countries, (though some still remained anomalous).

To some extent, the motivation to persist in school and expend effort towards learning is a function of perceived returns to education. Students need to know that putting in effort will lead to mobility and better outcomes in the future, in particular, higher earnings than otherwise. The availability and access to better jobs and job networks may play a part in influencing their persistence but this is not addressed here<sup>12</sup>.

As aptly put in Hannum and Buchman (2005), the understanding of human capital and the acquisition of it is essentially individualistic as social structures, contexts within school, home, and one's community shape individual circumstances. Much of the research in this field implicitly assumes that educational inputs will offer similar "enabling capacities" to different individuals.

## **Conclusion**

As cost barriers to accessing basic education are gradually eliminated, the role which non-cost barriers to schooling and learning play become increasingly important in understanding why universal basic schooling, and more importantly, functional literacy may not be achieved. India, China and Indonesia each face their own set of unique issues impeding access to education and learning. This throws up a need for feasible strategies that address the plethora of interrelated issues and constraints that go beyond directly observable barriers. The literature provides evidence that some of these less observable barriers can reinforce existing vulnerabilities and affect both a child's willingness to persist in school and his learning while in school. We now know that children's engagement in class is linked to their own experiences of what goes on in their learning environment and in their home environment. Often, policy is more limited in influencing what happens in the home environment compared to affecting change in their learning environment. This throws up the need to develop strategies to better understand the processes that work behind teaching and learning, and the inputs that matter for what outputs in which contexts. Recent studies suggest that this, in combination with shaper measures of inputs/outputs, go some way in allowing us to decipher ambiguities as well as well-established patterns found earlier, and to start examining what are the mechanisms that might trigger what sort of change. However, the literature does not claim

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<sup>12</sup> However, in all three countries, especially China, parents and even young children are well aware of the large extent to which society and employers value educational qualifications in the job market (of course provided that the candidate's ability is on par with qualification).

to have found the intermediate process in linking the two, but for now, many of these factors simply represent an independent determinant of inequality. Finally, it is worth mentioning an earlier point, that learning improvements have long-term impacts on individuals that carries on to subsequent generations, which serves as impetus to further improve this source inter-generational mobility for the marginalized segments of society.

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