

Lessons learned from introducing value added performance measures in Uganda

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Series description

This think piece is part of a series commissioned by the UK's Department for International Development (DFID). The purpose of the think piece series is to stimulate international debate on the future direction of education development in low income countries; provide direction for future DFID research priorities; and provide evidence products that can inform policy and programming decisions.

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About the author

Phil Elks is currently working for Ark, researching school performance measures in Uganda. He previously worked in the UK's Department for Education, leading work on primary school assessment and school accountability.

List of abbreviations

EGRA	Early Grade Reading Assessment
EMIS	Education Management Information System
GCSE	General Certificate of Secondary Education
IDA	International Development Association
KNEC	Kenya National Examinations Council
MoESTS	Ministry of Education Science Technology and Sports (Uganda)
OFSTED	Office for Standards in Education
OFQUAL	Office of Qualification and Examination Regulations
PEAS	Promoting Equality in African Schools
PLE	Primary Leaving Exam (Uganda)
SEN	Special Educational Needs
SES	Socio-economic status
UCE	Uganda Certificate of Education
UNEB	Uganda National Examination Board

1. Executive summary

A school's success in promoting learning is often measured in terms of the examination results of the students. Value added measures are designed to account for the ability of a school's intake to provide a fairer and more accurate indication of performance. They are being increasingly used to provide more accurate data about the quality of schools. In particular, value added measures are now used as the main indicator of school performance in the UK, and they are also widely published in the USA.

Traditional accountability measures using only raw attainment data can create a misleading impression of school effectiveness – flattering schools with a more advantaged pupil intake at the expense of schools serving poorer neighbourhoods. Focusing on 'value added' allows governments to identify schools which are performing well with a challenging student intake, as well as schools where attainment appears to be good, but where results are actually far less impressive. With this information, a government is better placed to focus its support and intervention on schools which are most in need of better teaching and leadership.

Ark conducted a research project to develop a value added performance measure for Ugandan secondary schools. Ark visited a nationally representative sample of 335 secondary schools. At each school we collected examination data so that we could compare students' primary and secondary leaving examination results, and some contextual information, such as the level of resources available and the experience of the teachers.

Ark's research project has shown that robust value added measures can be developed for secondary schools in Uganda. Primary leaving exam results account for 46% of the variation in secondary school examination results, showing the importance of controlling for this factor when evaluating school performance.

Importantly, a relatively simple value added model seems appropriate for Uganda. We have used a model in which prior attainment is used to create a 'predicted' Uganda Certificate of Education (UCE) score for each student. Our research indicates that is not necessary to control for other factors to make a fair measure of performance. For example, adding a control for socio-economic status (SES) would mean that the model could explain 48% of the variation in students' secondary school performance – only a marginal improvement.

From this year, improved data collection methods by the Uganda National Examinations Board (UNEB) mean that this type of 'simple' value added model can be created for almost all secondary schools in Uganda using existing government databases, and at minimal extra cost.

This method of calculating school performance has been positively received by major stakeholders in Uganda. Officials in UNEB have expressed interest this data being published as a counter-point to the narrower 'league tables' created by newspapers, which are based only on the percentage of students achieving top grades. In addition, the World Bank is working with the Ugandan Ministry of Education to put in place support for underperforming secondary schools. The intention is to use value added performance measures to identify low performing schools accurately, and then track their progress as they receive support.

Value added performance measures have also provided useful information to schools for self-improvement. Promoting Equality in African Schools (PEAS) manages a network of 28

secondary schools in Uganda. They have used this data to encourage head teachers to reflect on areas of strength and weakness, and adapt accordingly.

In Uganda, further work in partnership with the Government to embed this type of performance measure within the accountability framework will be valuable. It would also be useful to consider creating value added performance measures in other countries, and to explore further the potential for developing more nuanced performance data about primary schools.

2. Introduction

This think piece paper is based on a research project undertaken to develop value added performance measures in Uganda. The project was designed to collect data from schools to be able to develop the value added model and test its robustness. An associated working paper, including a description of the method and detailed data analysis is available (Crawford and Elks, 2016).

This paper summarises the research, highlighting the main findings in a more accessible way for a policy audience. The paper also discusses how this type of performance measure can be used in practice. It discusses how the Government and schools in Uganda have responded to value added performance measures. This may provide some insight into how improvements to the use of education data in developing countries can be achieved.

This think piece paper discusses the international evidence base on school accountability and value added measures in Section 1, highlights some central findings from Ark's research to develop value added measures in Section 2, and then moves onto discuss the implications for policy in Section 3 and school management in Section 4.

Secondary schools in Uganda

Some important features of the Ugandan secondary school system are summarised here (MoESTS, 2015; Crawford and Elks, 2016):

- The Gross Enrolment Rate is 30% (32% boys and 28% girls) and Net Enrolment Rate is 26%
- There are around 2,950 schools (1,060 government; 1,890 private).
- Around half of the private schools are part of the Universal Secondary Education programme, which provides funding per student under a public-private partnership arrangement. Funding is provided if students have achieved 28 or better out of 36 in their primary leaving exam (PLE), and the school meets other basic requirements.
- Ugandan secondary schools are often highly selective, requiring students to achieve a certain score at PLE to gain entry.
- The average senior 4 (the last year of lower secondary school) class size is 64.
- At the end of senior 4, students sit a UCE examination. Each paper is scored out of 9, with 1 being the best score and 9 the worst. Students' best 8 results are counted to give a final aggregate score out of 72.
- Two thirds of secondary schools identify themselves as rural.

3. Rationale and international evidence base

Internationally, value added performance measures are increasingly regarded as a fairer way to measure school performance. They control for the prior attainment of students and therefore provide a more accurate measure of the quality of education in a school. The education system in Uganda has the necessary pre-requisites to create value added measures for secondary schools. Measuring school performance accurately helps to create an 'intelligent' school accountability system, in which actions taken by government, schools or parents are based on good quality information. There is evidence that accountability systems can improve outcomes if they are well designed.

Key messages

Value added performance measures are fairer than student exam results alone, as they take prior attainment into account, which has been shown to impact future performance significantly.

Value added performance measures can form part of an accountability system that supports and challenges schools to improve.

i. Explaining value added performance measures

A simple value added measure can be created by comparing students' performance on a baseline examination (often a primary school leaving examination), and then a subsequent examination (often a secondary school leaving examination). To create a 'simple' value added measure, all students across the country with the same result on the baseline assessment are grouped together. The average result in the subsequent assessment for this group of students is then calculated. This creates a 'predicted' score for each student. Schools then receive points in the model for each student who has performed better than the predicted score, and lose points in the model for each student who has performed worse than predicted. The final value added score for each school shows the average number of marks above or below expectations achieved by its students.

The potential benefits of using value added measures include:

- Weak schools are no longer able to blame poor performance on having a disadvantaged intake.
- 'Coasting schools', doing just enough to achieve reasonable results with a high performing intake, are exposed.
- Schools performing well in challenging circumstances are identified, allowing best practice to be shared.
- Schools are given an incentive to teach all students equally: an extra mark for any student has the same impact on a school's performance on these measures, promoting equity.
- Government can focus interventions on the worst performing schools.

ii. Evidence base on value added measures

Value added measures are useful because of the strong correlation between students' examination results at the end of primary and secondary school. Analysis of UK data shows that the correlation between school-level end of primary school and GCSE results is as high as 0.81 (Paterson, 2013). Similarly, in Chile, 80% of the variation in school test score rank can be

explained just by socio-economic status (SES). Simple attainment measures can give a school credit as much for the ability of its intake, as the extra value it adds through good teaching.

There is some debate around whether value added models can still produce biased results despite considering prior attainment. A simple value added measure, as described above, implicitly attributes the remaining variation in performance to school or teacher quality. However, other factors such as the level of parental involvement and the student's SES are known to affect students' examination results.

Some value added models include extra variables alongside prior attainment in an attempt to minimise bias. However, Koedel et al. (2015) in a review of value added literature, conclude that this is "conceptually appealing because of their potential to reduce bias..., [but] the best evidence to date suggests that their practical importance is limited." Burgess and Allen (2010) confirm that including contextual information in value added models provides little or no additional benefit in the UK. The contextual value added model in the UK has also been criticised for embedding lower expectations for particular groups of students, and for this reason the Government stopped producing the measure from 2010.

Outside OECD countries, the impact of including contextual factors in value added models has been explored in Argentina (Cervini, 2006) and Chile (Muñoz-Chereau, 2013). In Chile, accounting for contextual factors as well as prior attainment improved the fit in the model marginally from 65 to 66% in language and 65 to 69% in maths.

When considering school results on value added measures, it is important to take into account that some measurement error will still exist. For example, in the USA, value added measures are typically used to analyse teacher rather than school performance, which gives a relatively small sample size. This has led to some criticism of the approach, and Macaffrey et al. (2009) have shown how larger sample sizes improve the accuracy of value added measures. This means that confidence intervals should be used when interpreting results, including for school level value added results.

Value added measures, like an indicator of performance based on examination results alone, can only give a partial picture of school quality. For example, schools also play an important role developing students' moral, social and cultural values, which cannot easily be examined. Data on school performance should be combined with qualitative judgements about other aspects of a school's work to give a rounded judgement. The Ofsted inspection framework in England gives an example of this approach (Ofsted, 2015).

iii. Using good quality performance measures

Fairer measures of school performance can be used as the basis for **school accountability systems**, and as **tools for schools to use for self-improvement**.

iv. Government using performance measures in a school accountability system

Measuring and sharing reliable data on school performance allows parents and policymakers to hold schools to account. When performance data forms part of an accountability system which has consequences for good and bad performance, it can create incentives for school leaders and teachers to perform better.

Evidence from research into accountability systems over the past 15 years indicates that accountability interventions can lead to improved results, but they need to **be carefully designed to establish the right incentives and success is heavily context-dependent** (Bruns, Filmer and Patrinos, 2011).

Evidence from high-income countries tends to suggest that accountability systems drive improved performance. In the UK, Wales stopped the publication of school league tables, which had previously highlighted weak schools to parents. This caused results to fall relative to England (Burgess and Allen, 2010).

Research in these countries also suggests that the government needs to play an active role in incentivising schools to perform well. A McKinsey review of the highest performing school systems in the world found that all successful systems have processes to identify poorly performing schools and methods to intervene to raise standards of performance. These interventions tend to involve challenging schools (with explicit consequences) or in some cases, providing support to schools to help them improve (Barber and Mourshed, 2007).

Furthermore, **evidence in the USA found that the introduction of accountability systems has had an extremely positive impact on student achievement but only in states that attach consequences to school performance** (Hanushek and Raymond, 2005). States that simply provide school performance information through report cards, without attaching consequences to performance, do not achieve the same large impacts as states in which consequences are clear.

In developing countries, the evidence on the impact of accountability systems is more mixed. There has been a lack of experimentation in system-level reforms, so the majority of research is based on smaller interventions and on the 'short route' of accountability – communities holding schools to account. Pandey et al. (2008) in India evaluated the impact of an information campaign to community members about their state-mandated roles in school management. This information had an overall positive impact: community participation in management improved, teacher presence and effort in schools increased, and student learning outcomes improved. This suggests citizens can effectively influence schools to improve if they know it is within their rights.

By contrast, another study in India (Banerjee et al., 2008) evaluated the impact of providing information to community members about their roles and responsibilities and training them to test student performance. These interventions had no impact on community involvement in schools or school-level learning outcomes. The authors conclude that citizens face substantial constraints in participating to improve the quality of service delivery.

In Uganda (Barr et al., 2012), provided information to community school management committees, but this only made an impact when the community was involved in the design of the school evaluation scorecard. The impact of the UWEZO learning assessments in East Africa also suggests providing information does not always lead to action and quality improvements. Despite the compelling findings from the annual assessments – which highlight the extremely low learning levels amongst children – a recent evaluation reported “there is no systematic evidence of UWEZO making an impact on improving outcomes” (Results for Development, 2015).

Overall, **accountability frameworks need to be carefully designed for their context to be effective.** A well designed framework can direct all actors in the system, including government, head teachers and teachers towards improving outcomes (Pritchett, 2015). However, a poorly designed system can direct schools towards focusing on particular student groups, or activities that do not ultimately lead to better outcomes.

v. **Designing an effective accountability system for Uganda**

Some elements of an effective accountability system are in place in Uganda – in particular, there are national exams at the end of primary and secondary school, and school performance data are widely published. However, the current system has significant limitations.

At present, the main performance measure used by government and parents to evaluate schools is based on the percentage of students who achieve a Division 1 grade in the secondary school leaving exam (UCE). The media publishes widely read ‘league tables’ of school performance on this basis. However, as Division 1 is a challenging grade, achieved by only around 8% of students in the country, almost half of schools are not included in the league tables.

The percentage of students achieving a top grade is central to any conversation with a school leader about their success. **Many schools focus their teaching on high performing students, at the expense of taking time to ensure that others have grasped the building blocks of literacy and numeracy.** There are also reports of schools encouraging students to drop out if their internal assessments indicate that the student will not secure a top grade for the school.

Recent research demonstrates that schools’ focus on high performing students (Ark, forthcoming). From a nationally representative sample of schools, around three quarters of schools have outcomes based targets only in relation to the number of Division 1 grades they are aiming to achieve. Many schools in Uganda provide extra pay to high achieving teachers, and in over half of cases, this reward is based purely on the number of top grades secured. This incentivises teachers to focus on high performing students at the expense of others.

The school accountability system in Uganda is also limited by government capacity. For example, each district has a school inspectorate, but it is often insufficiently resourced to allow inspectors to reach all schools.

Some useful lessons can be drawn from the experience of England’s former secondary school accountability system that created a range of perverse incentives. For over ten years, schools were primarily held to account based on a threshold attainment measure – the percentage of students achieving 5 A* to C GCSE grades (or equivalent vocational qualifications), including in English and maths. This has similarities to the performance measure used in Uganda. The negative effects of the threshold attainment measure included:

- Unfair identification of weak schools: Schools working in the most challenging circumstances, in which students arrived with very low prior attainment, were sometimes identified as performing unacceptably poorly, even if they could not reasonably have been expected to perform better.

- Schools with high prior attainment allowed to 'coast': Schools with high performing intakes were identified as underperforming very rarely, even if they were not supporting their students to maximise their potential.
- An excessive focus on students close to the threshold (in this case the C/D borderline at GCSE): This was sometimes at the expense of good teaching of all the students in the school.
- Students entered into 'easy' qualifications: Students were entered into courses where it was perceived to be easier to achieve a C grade, rather than the qualifications that would be most useful to the students in the future.
- Stresses on the qualification system: The pressure of the accountability system contributed to schools over-marking controlled assessments to meet the grade C boundary targets (Department for Education, 2012).

As a result of these weaknesses, the UK has now moved to a system of accountability based on value added performance measures.

vi. **Schools using performance data for self-improvement**

Reliable data on school performance can also be used by school leaders to help them benchmark their performance, highlight areas for improvement and motivate change. There are many case studies of schools using these approaches to increase performance.

Research evaluating the impact of diagnostic feedback and performance data to teachers suggests that providing schools with report cards on performance data can be effective, but this is not always the case in isolation. Muralidharan and Sundararaman (2010) show that report cards led to improved behaviours of school directors and teachers, but had limited impact on student learning outcomes. These findings suggest that a simple policy of providing feedback to schools may not be enough to improve student learning outcomes. There may need to be a parallel intervention to increase demand for such tools, for example, with incentives for head teachers to use the data effectively (bonuses or consequences for poor performance). In Mexico, a recent study has shown that a relatively small amount of support may be sufficient to lead to improved learning outcomes (De Hoyos Navarro et al., 2015). Schools performed better on average after a one-off intervention from an expert to help schools create an improvement plan based on evidence.

In Uganda, headteachers receive their examination results, but receive little support to analyse the data and use it for self-improvement. Head teachers also have some limitations to their scope to act on performance data. For example, in government schools teachers are employed centrally, and the school is not able to terminate the contracts of poor teachers themselves. Despite this, successful head teachers manage to drive improvements within their school, for example by setting clear targets for teachers, and persuading weaker teachers to leave.

4. Research to develop value added performance measures in Uganda

Ark collected examination results data from a representative sample of secondary schools to develop and test a value added performance measure for Uganda. The value added measure was shown to be robust, and provides useful additional information about school performance.

vii. Method

The current composition of the Ugandan exam system makes it possible to develop value added measures for Ugandan secondary schools. To construct a value added measure you need to compare individual students' performance on a baseline assessment and then a subsequent assessment. In Uganda, all students sit a PLE after seven years of education, and then a secondary school leaving exam (the UCE) after four more completed years of study.

For a value added measure of school performance to be useful, prior attainment should be a significant predictor of future performance on average, indicating that it would be very difficult for schools with a low ability intake to achieve very high attainment scores. The measure should also give new information about the performance of a significant number of schools, compared to using only attainment data.

In 2015, Ark initiated a data collection project to gather results data from schools to develop the model. At this point, the Government of Uganda's data systems did not allow them to track an individual's performance from PLE to UCE.

Ark collected data from a nationally representative sample of 335 secondary schools from 36 districts, sampling 31,932 students (see Table 1). The researchers stratified the sample at regional level and then randomly sampling districts per region. Within each district, the sample was then stratified by school type, collecting data from four public and six private schools, chosen at random. Data were collected on all students from appropriate years.

Table 1: Sampling frame

	Central	East	North	West	Total
Uganda – full secondary school data from 2013 EMIS					
Districts	24	31	22	25	102
No. of secondary schools	884	706	362	818	2770
No. of secondary school students	38,0761	38,9995	147,537	323,415	1,241,708
Sample for value added research project					

Key messages

Ark created a 'simple' value added model, using examination data only.

The model is suitable and reliable for Uganda:

- Adding background variables (like SES) only improved the model very slightly and therefore is not necessary.
- The value added model categorises schools differently to attainment measures, and improves our understanding of school performance.

Districts sampled	10	10	6	10	36
No. of schools sampled	90	84	74	87	335
No. of students sampled	9,386	8,657	6,536	7,353	31,932

In each school, the researchers collected the following;

- **Student result data:** UCE results were collected for each student who sat exams in 2014, including aggregate score, Division, and English, maths, and science results. In addition, the corresponding PLE scores were collected for each student, along with their gender and the year they enrolled in the school.
- **School profile data:** A short questionnaire was administered to the school leaders to collect contextual information on school resources, management and teachers.
- **Student SES:** An SES survey of students in the fourth grade of secondary school (S4) was conducted. This data is not linked to the individual UCE test score results (test scores were collected of students who were no longer at the schools), and instead just gives an indication of school-average SES.

In addition, for 153 of the schools, data were collected on 2013 UCE scores and corresponding PLE scores in order to test the stability of the model over time.

viii. The value added model used

The researchers investigated whether a 'simple' value added model could be developed for Uganda. They favoured this type of model because:

- It is possible to create using examination data only.
- It is relatively easy to explain to teachers. No knowledge of regressions is required to understand how a score is created for each school. A school score is simply the difference between the predicted and actual results of its students.
- Table 2 shows how a school value added score is calculated. The school value added score here is +1 – the average of the students' scores. Students in this school achieved one point more than expected in their UCE exams.

Table 2: Calculating the value added score

	PLE score	UCE score	Estimated UCE score	Value added score
Student A	14	40	45	+5
Student B	14	47	45	-2
Student C	14	45	45	0
Average				+1

ix. Testing the model

Ark's research showed that primary leaving exams accounted for 46% of the variation in students' UCE results. This shows the importance of controlling for primary attainment when evaluating school performance, and the extent of the advantage for schools with a high achieving intake when performance measures are based on exam results alone.

Other important findings include:

1. The 'simple' model compared well with regression based value added model.

Value added models based on regression techniques had very similar R-squared values of 0.46 to 0.47.

In addition, for the simple model to be appropriate, each better score at PLE needed to predict a better score at UCE. The model performs well in this respect. The only exceptions were at either end of the distribution, where we collected data on less than 250 students for each of these PLE scores. A larger sample size is likely to resolve the issue, and for the purposes of this research, scores at the extreme ends of the distribution could be grouped together.

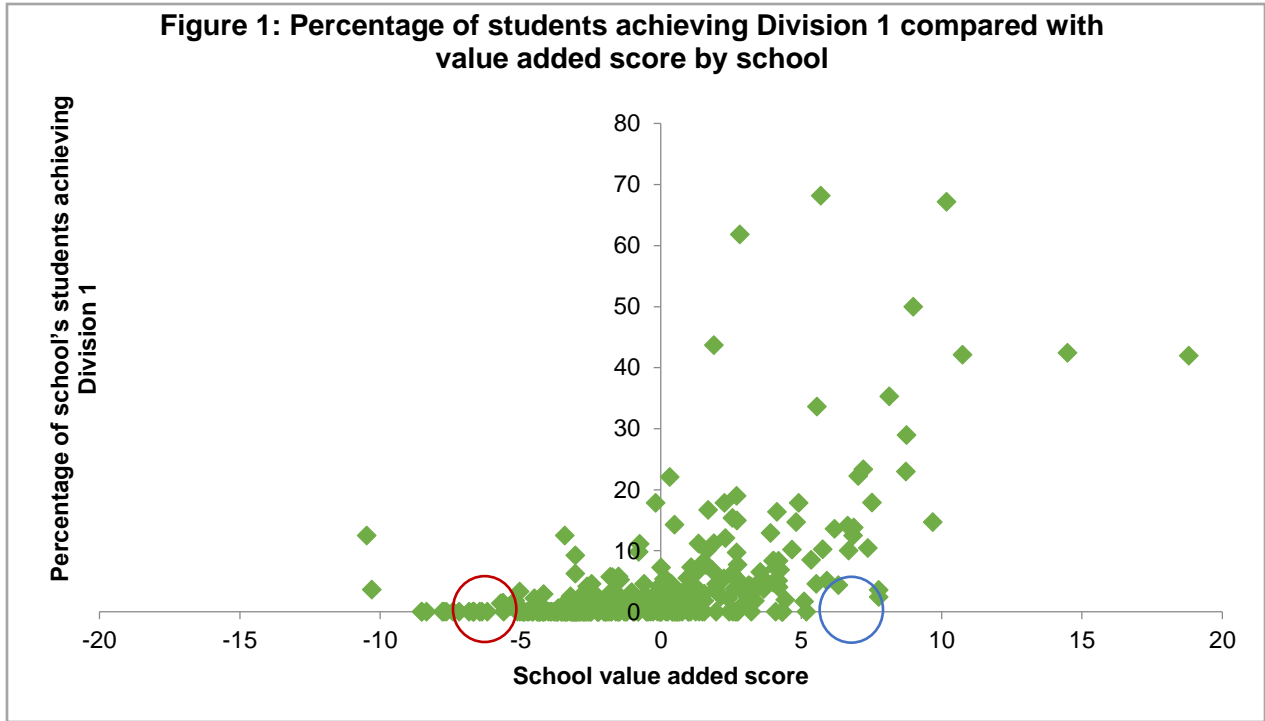
2. The impact of including additional variables, such as SES, in the model was limited.

Including a student background variable (based on a school-average SES) increases the regression model fit (r-squared) only marginally, from 0.46 to 0.48. This suggests that it is not necessary to control for this factor to produce a fair performance measure. SES has already influenced PLE scores of students and so is accounted for by proxy. Other variables we collected, such as whether the school was in a rural or urban setting do not make a difference to the fit of the model.

Despite this small impact on the model, there is still some link between the SES of the students and the value added of the school. A simple regression shows that SES can explain 9% of the variation in value added scores. However, it is important to note that the impact of SES on value added is much less strong than its impact on raw attainment measures – a 1 point increase in SES is associated with 0.44 point increase in value added, compared to a 2.45 increase in test scores.

3. The value added model categorises schools differently to attainment measures, and so improves understanding of school performance.

Figures 1 and 2 illustrate the benefits of using this approach. Figure 1 compares value added results to the Government's current lead indicator of school performance, the percentage of students achieving a Division 1 grade. It shows that value added data allows a policymaker to distinguish between all the schools in which 0% of students achieve a Division 1 score; some of these schools have very weak teaching (those in the bottom left of Figure 1, in the red circle), whilst others are performing reasonably well with a challenging intake (those in the bottom right, in the blue circle):



Value added measures also provide more useful information compared to a more nuanced attainment measure based on the average aggregate scores of students in each school.

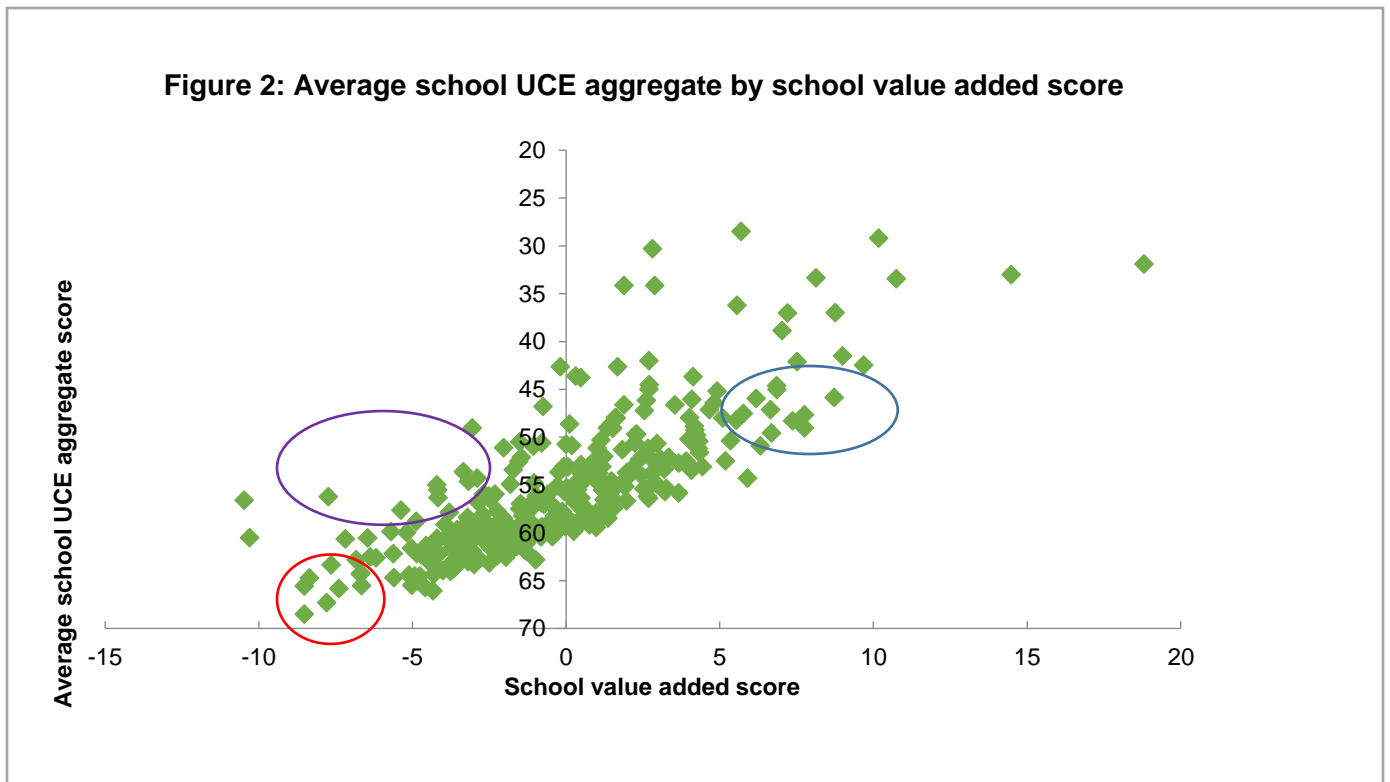


Figure 2 highlights two groups of schools which provide particularly useful additional information for government:

- Red (no more excuses category): These schools can no longer blame poor results on challenging circumstances. Value added shows the school is doing badly compared to peers with the same intake, and needs to improve.
- Purple: These are weak schools that are letting down their students, but whose underperformance is 'hidden' on attainment measures alone. If they bring up their performance just to the average then most of their students could jump a division.
- Blue: These are schools with very high value added scores, despite not having outstanding attainment results. Their success would not normally be recognised. Other schools could learn from this good practice, particularly because these schools are managing to perform well in relatively difficult circumstances.

Some schools do perform well on both attainment and value added measures. This is partly because some traditionally high performing schools also have good teaching. These schools also have an advantage in that they select high performing students only, leaving less need to differentiate their teaching. Nevertheless, this chart shows that schools with a wide range of intakes can perform well on the value added measure.

4. We can say with confidence that a significant number of schools' performance was above or below average.

Of the 335 schools in the study, 110 schools have a value added score statistically significantly above average, and 74 schools are statistically significantly below average. The remaining schools cannot be statistically distinguished from 0. This finding, that it is possible to distinguish around half of schools from average, is in line with value added analysis of school performance in other countries.

5. School value added scores in Uganda show similar consistency over time to other countries, but there is still a need to interpret the data carefully.

Value added scores aim to understand school quality. If actions are to be taken informed by value added data, then it is important that there is some level of consistency, which suggests that school value added results reveal the underlying quality of the school, rather than natural year on year variation.

Whilst specific school value added scores are not perfectly correlated over time, this is to be expected given different student cohorts, natural changes in school management and teaching staff over time, and some random variation. The 2013 value-added score predicts 44% of the variation in 2014 value added scores, which is in line with results of value added models in the USA (Kane and Staiger, 2002).

A majority of schools in the top and bottom quartiles of the value added score ranking in 2013 remain in the top or bottom in 2014 (56% and 60% respectively). However, this also means that a significant proportion of schools move across quartile boundaries.

The implications of this variation over time need to be considered if the model is to be used in a policy context. The Department for Education in the UK has considered a similar issue. They decided that value added scores in one individual year will still be used as the headline indicator of school performance, and so will drive decisions around which schools to inspect as potential underperformers. However, three year rolling averages will also be published, to facilitate more nuanced discussions and judgements about school performance.

Further analysis and robustness checks are published in an associated working paper (Crawford and Elks, 2016).

x. **Implications from the research**

The 'simple' value added model appears to be **robust and appropriate for the Ugandan context**, and the measures appear to have significant potential to provide better information to the Government and parents about school performance.

The findings around the impact of SES on school scores and the variation in school performance over time suggest that careful consideration is required to **use the data appropriately in a policy environment**.

This success in creating a simple value added performance measure for Uganda suggests that a **similar approach could be adopted in other countries** that have an end of primary and end of secondary school national examination. Some similar robustness checks would be valuable if other countries look to develop the model.

5. Embedding value added measures in the Ugandan education system

Value added measures can be published to provide better information to communities, or can be used by governments to drive higher performance. The Government of Uganda has expressed considerable interest in the development of value added measures, and the Uganda National Examinations Board (UNEB) has asked for the measure to be created for all secondary schools based on 2015 exam results. This performance measure is likely to be used in a project to identify accurately schools in need of extra support. Further work is needed to embed the use of these measures within the broader education system.

UNEB has recently started to collect sufficient data so that these performance measures could be created nationally at very limited extra cost.

Key messages

Value added measures can be used to design and track programmes – for example, in Uganda to identify schools most in need of support.

Government can use value added measures to enhance accountability by improving transparency on school performance, improving inspections, and/or challenging schools.

The MoESTS and UNEB have shown considerable interest in using value added measures, recognising the limitations of the existing attainment measures.

xi. Policy options for using value added performance measures

Before presenting data to the Government, Ark considered different ways in which value added measures could be used to improve policy in Uganda.

- **Publishing data and improving transparency for parents and communities**

Each school's value added results could be published transparently – either through government websites, or working with a newspaper that already produces 'league tables' of school performance. This has the potential to help parents make better-informed choices between schools. It could also provide schools with an incentive to improve the results of all of their students, rather than simply focusing on those who might achieve a Division 1 score.

In Uganda, school performance data is already widely available through the media. There is some debate about the negative consequences of this. Anecdotal reports suggest that some schools stop students progressing to S4 if they are unlikely to perform well in the UCE examination, and some argue that schools focus excessively on test preparation at the expense of teaching a broad curriculum. However, given the selective admissions system for further study and level of public interest in the media-produced league tables, a radical shift away from this practice is unlikely. In Kenya, the Government has banned the publication of primary school exam results, but online media continues to do so.

Value added measures could help to mitigate the negative effects associated with the publication of school league tables. They may help to reduce the practice of schools encouraging students to drop out because even those students with low academic results can still contribute positively to a school's value added score. It is much more challenging for a

school to identify and 'manage out' those students likely to have negative value added scores, as opposed to those students who are not on course to achieve a Division 1 score.

A new risk with value added measures is that the public might also over-interpret small differences in scores to be statistically significant. There are ways of minimising this concern. For example, scores can be published with a red, amber and green coding, with red or green showing when scores are statistically significantly different from average.

More generally, the value added measure is more complicated to understand than the current school performance measure. **The extent to which parents can accurately interpret this information would benefit from further exploration, and there is a risk that high-income parents will be better placed to interpret and act on the data.** If parents struggle to interpret the data, then its benefits for promoting improvement through school choice may be limited. Despite this, publishing the data could still change the incentives for schools, and encourage some of them to work to achieve better value added results. Head teachers may still seek the benefits of public recognition of their work, even if it brings acknowledgement from their peers, rather than affecting their enrolment numbers.

- **Identifying schools in need of support**

Our research shows that value added data helps to identify the weakest schools, (those most in need of support), in a more accurate way. Decisions about which schools to support can be made by using value added data alongside other information about a school, including from school visits. These visits can show, for example, whether schools have the capacity to improve and benefit from support.

- **Challenging schools with poor performance**

Value added measures can be used directly by the government to identify underperformance and challenge those schools. They can also be used to inform school inspections, including prioritising which schools to inspect, and then giving inspectors greater evidence to challenge schools in areas of weakness.

Governments in lower-income countries tend not to have developed systems for challenging schools. Poor school performance can be seen as a result of limited resources and under-qualified teachers, rather than weaknesses in school leadership and teaching. Value added measures offer an opportunity for governments to revisit this assumption. Our research shows that some schools in challenging circumstances, with low levels of resources and relatively inexperienced teachers, can perform very well on this measure. By comparing schools to others with a similar intake, it is harder for head teachers to explain away poor performance by referring to the circumstances of their school.

If a greater element of challenge is put in place, then it is important that the data is used as a starting point for discussion, rather than as the final judgement on school performance. For example, our analysis shows some variability between school results year to year. If a head teacher can make a compelling case that particular circumstances influenced the results in the previous year, this should be considered before making a high stakes judgement about a school.

Government decision-makers and school inspectors need the professional skills to interpret arguments from schools. Our research shows that schools in a rural location, those admitting students with low attainment, or those with limited school resources need not be performing poorly. However, schools could legitimately argue, for example, that a cohort with a high number of students with a particular type of special educational needs (SEN) had an influence on results. School inspectors would need to have the discretion to provide a positive report about academic achievement in these schools, despite the initial indications from the data.

Value added data could also usefully be considered alongside other data about school performance to develop a rounded picture of a school, including information about student's attainment, and data about the number of students dropping out from the school.

xii. Lessons learned from working with the Government of Uganda to embed value added measures in the accountability system

• Working with the MoESTS

The findings have been presented at a series of meetings with senior officials at the MoESTS, and to the majority of the MoESTS's senior management at a World Bank-organised conference in October 2015. As well as presenting the model, we have argued that fairer and more accurate data about school performance would allow the Government to develop an accountability framework.

Overall, MoESTS officials have shown considerable interest in having access to this data. Some officials have focused on the equity benefits of this project, in terms of encouraging schools to focus their efforts across the ability spectrum. This shows that officials see the potential benefits of accountability reform in changing the incentives for schools. Some officials have reported that they have introduced the idea of student progress into their presentations to head teachers, and encouraged them to consider their success in these terms.

The Directorate of Education Standards, which manages the school inspection process, has shown an interest in giving inspectors information about value added performance before they visit schools. At present, inspectors are encouraged to focus on attendance, lesson planning and basic infrastructure being in place. Adding a greater focus on learning outcomes to inspection visits, and giving inspectors a stronger basis on which to demand improvement from head teachers, may be the clearest policy use in the Ugandan context.

From discussions so far, officials in the rest of MoESTS are hesitant to consider sanctions for underperforming schools. Their current position is that head teachers require professional support and positive incentives (such as public recognition) to improve their work. A significant culture shift in the Ministry would be required for this viewpoint to change.

The Government has been more receptive to suggestions to develop lighter-touch accountability systems, for example, creating and publishing better information about all schools, although they have little capacity to take forward this type of policy development without external support.

• Working with development partners and MoESTS to use value added in individual projects

A proposed International Development Association (IDA) loan to the Government of Uganda for a secondary school development programme provides an opportunity for the value added data to be used in practice. One strand of this project is intended to identify low-performing schools and work with them to improve. The intention is to use value added measures to identify those schools that need support more accurately, and then to track the success of the interventions given to those schools. At the time of writing, this project was going through World Bank and MoESTS approval processes.

Used in this way, value added measures can ensure that a new project promotes equity, and is evaluated fairly. Schools could not simply improve their performance by admitting higher ability students, and schools in this project will need to consider the result of every student.

Value added measures could have similar benefits in other projects. For example, the Government of Uganda is considering how to improve the regulation of private schools that receive some public funding. Value added measures could allow the Government to evaluate academic outcomes in these schools without creating a perverse incentive not to admit more challenging students.

Starting to use value added measures at a project level could be a useful way to embed more nuanced performance measures more broadly within MoESTS. The IDA-financed project should make sure that value added information on all schools will be created every year, providing ongoing opportunities for policymakers to see the benefits of using this data at a system level.

- **Working with UNEB**

UNEB's remit incorporates the effective dissemination of examination results. Senior managers there have concerns about how media reports give a misleading picture of school performance, which therefore undermines their work.

Accordingly, the value added proposal has the potential to alleviate an issue already identified by UNEB, one which they previously did not have the capacity to investigate. In response, UNEB has shared data to create national value added performance measures, and has recommended the project to the MoESTS. Senior officials at UNEB have indicated that they would like to explore how this information can be published, and will consider this further once a national dataset is available.

The role of the examination board in facilitating this project has been crucial in Uganda, and this relationship is likely to be important in other countries seeking to adopt improved performance measures.

xiii. **Next steps for scaling up**

Reforming the accountability system is not currently a priority area for the MoESTS. For example, it is not included in the education sector plan (which expired at the end of 2015 but has not yet been replaced). Advocacy to change this system-level focus requires very strong evidence and ongoing work in partnership with the MoESTS.

- **Generating further evidence to support ongoing engagement**

The MoESTS has indicated that further evidence from Uganda about the potential benefits of promoting accountability systems would be beneficial. Whilst international evidence for

changing accountability systems level is strong, much of the literature around accountability systems relates to developed countries.

Ark's research in 2015 showed:

- There was no correlation between school performance and factors such as rural/urban location, experience of teachers, or availability of computers and libraries.
- There was no overall difference between public and private schools, and the correlation between higher fees and better performance was very weak.
- Boys make faster progress than girls during secondary school, with an average value added score of one mark higher.

This evidence on education inputs is in line with international evidence, and indicates that increasing resources is unlikely to have a significant impact on outcomes. However, MoESTS officials are looking for strong, positive evidence about effective strategies as they develop a new set of priorities.

Consequently, we conducted some follow-up research **to evaluate the impact of school management on performance**. We interviewed 200 school leaders from the same representative sample of schools involved in our original study. This research showed that better management is correlated with better outcomes in a statistically significant way: on average, value added scores are almost 2 marks higher in a well-managed school compared to a poorly managed school. An increase of 1 standard deviation in the management score is associated with an increase of 0.166 of a standard deviation in school value added, after controlling for other factors. **This creates a case to focus on improving school management as a means to improving outcomes** (Ark, forthcoming). Ark has been invited to present these findings to the senior management of the MoESTS.

- **International implications**

The experience of discussing value added performance measures in Kenya also suggests that **governments can be receptive to using this data if it complements existing programmes**. The Education Standards and Quality Assurance directorate in the Kenyan Ministry of Education have developed a school inspection framework that is closely aligned to Ofsted's model in the UK. There are references in the framework requiring inspectors to consider the value added by each school, but they are not given robust data to underpin this evaluation. The type of value added performance measure discussed in this paper could be used to enhance the existing framework, and Kenyan officials have requested that the project is presented to the senior management team at the Ministry, after hearing about the project in December 2015.

xiv. **Readiness of information systems to create value added data**

Although the Education Management Information System (EMIS) does not collect data on individual students, UNEB has recently put in place information systems which would enable them to create value added performance data for secondary schools.

In 2015, UNEB moved to an electronic registration system for examination candidates. When each student registers for UCE, they must provide their PLE candidate number. This information will enable UNEB to create a dataset with both PLE and UCE results for each student. This can operate even if the PLE exam was not taken four years ago, as would normally be expected.

UNEB estimate that it will take one day's work to create the dataset required to create value added performance measures.

The simplest approach for any examination board or country to develop the necessary dataset would be for each candidate to have the same unique number for primary and secondary leaver examinations. However, local solutions can also be put in place. Taking Kenya as another example, the examination board there requires students to provide their birth certificate number when registering for examinations, both at primary and secondary level. The Kenyan National Examinations Council (KNEC) anticipate that this information can be used to create the dataset required for value added measures.

The simplicity of this approach means that other countries should be able to **create these performance measures at low cost and with no or relatively small changes to existing information systems**. Changes to the more complex EMIS systems, which sometimes do not collect information on individual students, or can have pressure on space within questionnaires and compliance issues, are not necessary.

xv. **Education system limitations to create national value added measures**

- **Creating value added scores for all schools**

UNEB data can be used to create value added performance measures for the vast majority, but not all schools. UNEB collects information about the exam centre at which students sat UCE, rather than the school they attended. Almost all schools are themselves exam centres. However, some very small schools and some private schools are not, and their students travel to a neighbouring school to sit their examinations.

For larger schools, which receive additional candidates simply to sit the exams, there is no systematic issue. UNEB captures whether each candidate is 'internal' or 'external', and external candidates can be omitted from the analysis. However, value added performance measures cannot be created for schools which are not exam centres. No record is kept of where the 'external' candidates studied.

A small change to UNEB data systems to record each student's school as well as the exam centre would be simple and beneficial. It would create better data, both in terms of attainment and value added scores, particularly for small schools. Better links between UNEB and the EMIS databases should also be explored. Ensuring that exam centres can be easily linked to schools in the EMIS dataset would allow for more detailed analysis about determinants of performance.

- **Contextual information about students**

UNEB captures information about age and gender of each candidate, and whether they have a special educational need. Our work to develop this model has shown that collecting contextual information about students, such as SES, was not necessary to create a fair measure of school performance. However, understanding the performance of different student groups, including girls, could be very useful for research purposes and evaluating interventions.

Capturing more information about students with SEN may be useful and achievable.

Understanding the performance of students with different types of SEN across the country could encourage support programmes to be put in place and promote equity. This would require UNEB to communicate codes for different types of SEN, which schools could enter when they register students for UCE. Whilst this step is relatively simple, accurate and consistent use of these codes in different schools would remain a challenge. Nevertheless, this could be a worthwhile issue to explore further.

Capturing information about where students have studied and their SES would be useful, but is not a priority in the short term.

For this performance measure, it would be useful to know how long a student has studied at a school. It can be seen as unfair for a school to be judged on the performance of a student who has only studied there for one year out of the the four years of lower secondary school.

Knowing the SES of every student taking the UCE examination would enable a more robust test of whether a control for student characteristics is necessary to improve the fairness of the value added model. It would also allow policymakers to measure the performance of disadvantaged students, and then track whether interventions are successful for this group.

However, this type of information would be very challenging to collect nationally. The short survey used to measure SES in Ark's research study took around 15 minutes to administer. Whilst not overly intensive, this type of imposition on students across the country around the time of their examinations is significant, and there would be considerable central costs to manage the data. Similarly, tracking the movements of students between schools would only be reliable within a much more complex EMIS data collection.

- **Official capacity requirements for governments to use this data effectively**

Once the data is in place, the government also needs the capacity to use the information to drive improvement. The requirements for this element of capacity building would depend on the policy options the government chooses to take forward.

As an example, considerable capacity building would be required for the data to be used as part of school inspections. The Department for Education Standards is responsible for managing a local inspection team in each of Uganda's 112 districts. Whilst there are reports of good practice in some districts, there are limited opportunities for training local inspectors, and best practice is rarely shared between districts.

6. Schools in Uganda using value added measures

Some schools have used the value added data from our study to understand their performance better, particularly around the progress different groups of students are making in their learning. After having the opportunity to discuss the data, they are considering how to adapt their teaching accordingly. Further research into whether this approach could be operationalised within the Uganda education system, and the ability of school leaders to interpret the data with no support, would be valuable.

xvi. Potential uses of value added data for school self-improvement

Value added data can give schools valuable information to improve their own performance. Their overall school value added score gives a more accurate reflection of performance. This can, for example, motivate 'coasting' schools to improve.

More importantly, detailed analysis of the value added data can show areas for improvement. Value added measures can be created for girls and boys in each school. **Nationally, boys make more progress than girls through secondary school** and the value added data can help to showcase this inequality, and encourage schools to develop strategies in response.

Value added performance data can also be created subject by subject. PLE aggregate scores across all subjects can be used to predict results in, for example, English, maths or science. Our research shows that each better PLE result is also associated with a better UCE score in individual subjects, except at extreme ends of the distribution.

This information can help schools to identify **strong and weak departments** and develop strategies for improvement. Value added data are much easier for schools to use than attainment data for this purpose. Examination results in sciences are much lower than in other subjects (with up to a 50% failure rate in some science disciplines at UCE). Whether this is a result of more difficult examinations, limited resources for practical science, or weak teaching is not clear. However, it does make it hard for head teachers to compare teaching quality between subjects. Value added data allows a comparison with the actual performance of other students in the same subject, creating realistic benchmarks for head teachers to use.

Value added data also provides better information about the achievement of high and low ability students. Schools can isolate the performance of these different groups of students, and understand whether they are differentiating their teaching appropriately.

Value added data for the average achievement for students with each PLE score are also useful for **schools to set targets for individual students**. This requires professional judgement from teachers; the 'expected' performance of each student is useful to set realistic expectations, but equally schools should be setting high expectations for students to maximise their potential, rather than simply achieving the average.

Key messages

Value added measures have been used by PEAS to understand performance, and develop school improvement plans in their network of schools.

Some other schools have responded positively when presented with the data and have ideas on how to use this to change management and teaching practices.

- **Use of value added data by Promoting Equality in Africa Schools (PEAS)**

PEAS manages a network of 28 secondary schools in rural Uganda. They specifically target disadvantaged areas of the country. The network of schools is supported by a central team, which includes members of staff working on school improvement, teacher training and school inspection. PEAS requires all head teachers to use data to inform an annual school improvement plan.

Value added scores were calculated for PEAS schools. This information was then presented to their central school support team. Using value added data compared to raw attainment data gave the PEAS team greater insight on the performance of their network of schools:

- **Value added data shows that PEAS schools are performing well.** On average, schools have a positive value added score of +2.2, indicating performance at the 75th percentile. Using attainment data alone, PEAS results are very similar to the national average.
- **The variation in performance of PEAS schools is higher than when attainment measures are used.** Value added measures indicate that Akoromit school is in the top 1% of schools in the country, compared to in the top 5% when based on analysis of attainment measures. Equally, two PEAS schools were shown to be underperforming much more significantly when value added measures were used. The PEAS management has acted to improve leadership in these schools, and initial analysis suggests significant improvements in their results in recently completed UCE exams.
- **PEAS schools are performing very well for students who arrive with relatively low performance.** PEAS put in place additional support for students who have not learned the basics of literacy and numeracy when they arrive in S1, which may explain this finding. However, the data shows that further work could be done to improve the performance of high potential students.

These trends were known to the PEAS senior management team from previous analysis they had conducted. For example, attainment data had shown that fewer than expected students were achieving the highest grades, which suggested a greater need to focus on how to support high potential students better.

However, the value added data provides greater evidence for these arguments, giving network managers and head teachers greater confidence to focus their efforts accordingly. In addition, it provides a stronger basis for tracking whether interventions designed to address any weaknesses are proving effective.

As well as using this information at the network level, PEAS have trained school head teachers to interpret and use the data. Each head teacher was given a two page report showing overall value score compared to national and network benchmarks, and a breakdown of performance. An example report is included at Annex A. Teachers were encouraged to reflect on what might explain their schools' results and differences by subject and gender.

Value added was well received by head teachers, who asked questions about, for example, how poverty and other environmental factors impacting learning are controlled for in the model. School leaders were encouraged to set targets for improving their value added while developing their 2016 school improvement plans. These targets were set in consultation with the PEAS

central management team, who helped school leaders develop school-specific strategies to improve performance in particular subjects/departments, or with particular sub-groups (such as girls or high potential students). As a network, PEAS has also begun to use value added as a key indicator in reviewing school performance. Each school's average value added score is tracked alongside its average UCE score as a means of evaluating overall school quality and management team performance.

- **Response of other schools to value added data**

The researchers visited six other schools from our main study to present value added data, and understand the response of head teachers. Schools were presented with their overall value added score, and then a breakdown of performance for English and maths, girls and boys, and students with low, middle and high results at PLE.

In three out of six cases, a good level of interest was received from the head teacher. For example:

- At one school in Kalungu district, the value added data showed the school to be in the top 10% in the country. This surprised the school leaders, and provided vindication of some of their management techniques such as encouraging teachers to provide feedback on each other's lessons. **This school found the data by prior attainment particularly valuable.** Students with low prior attainment perform relatively well in this school. The head teacher could link this to 'catch-up' lessons provided for struggling students, but this data encouraged her to consider how they were providing similar tailored opportunities to high potential students.
- At another school in Lwengo district the head teacher already had a good tracking process in place, in which he noted the PLE performance of students alongside their current results in internal assessments. He felt this project validated his approach of considering student progress. **Sharing national data on PLE and UCE comparisons encouraged him to consider whether targets he was setting for individual students were suitably challenging.**

The three schools which engaged less well with the information did show some interest in the data, and easily understood the concept and potential benefits, but it did not seem to provoke any reflections on their practice. These schools were not performing worse overall, and further work would be needed to understand if there are groups of head teachers who are more or less responsive to a data-driven approach.

This exercise suggests that providing performance data, alongside an explanation and a discussion about conclusions to be drawn, could be a valuable way of improving practice, although further research would be needed into the impact. In Uganda, discussions based on this performance data could take place when district education officers, district inspectors or coordinating centre tutors (teacher trainers) visit schools. **Further exploration into whether this type of approach could be operationalised within existing Ugandan education structures would be valuable.** In particular, district officials need to have the skills to interpret the data and draw out key points for discussion with head teachers.

It would also be interesting to research whether simply sending the data to schools encouraged any changes in practice or performance in the absence of any associated discussions, although

international evidence suggests this is unlikely to be sufficient to drive improved outcomes. At the next stage of this research we intend to send schools feedback about both the value added data project and the management survey we have completed, which could provide the opportunity to test this.

7. Conclusion and areas for future research

- **System level projects and accountability reform**

In Uganda, value added measures can provide better information about school performance. These measures can be created at minimal extra cost. There is considerable interest in this information about school quality within the Government, and it is likely that value added measures will be incorporated quickly into individual projects in Uganda.

In order to maximise the benefits of creating these performance measures, they should be used appropriately within the wider education system. There are clear opportunities for value added measures to be part of an improved accountability framework. It is necessary to work closely with the Government to show the potential benefits of accountability reform, and to use government expertise to develop changes that are appropriate for the context. Adapting an accountability framework requires a detailed understanding of how incentives affect the behaviour of teachers and school leaders, and the capacity building requirements for the data to be used effectively. Uganda is due to develop a new education sector plan, and this process may provide the opportunity to review the accountability framework.

There could be considerable benefit in **embedding investigations of accountability frameworks in wider system level reform efforts undertaken by donors**. In Uganda, DFID has started to work with the Government to enhance the assessment system. This programme of support is also considering how the data from examinations is used to improve outcomes. Other system-level reform programmes could consider the potential for changes to the accountability framework, the impact of performance measures on school behaviour, and the possibility of using value added performance measures.

- **Developing value added measures in other countries**

Based on the list of national learning assessments [at the Education Policy & Data Centre](#), the Ark researchers counted 27 developing countries with standardised tests for primary and secondary school leavers.¹ Other countries, particularly in South America, administer very large national assessments, which are not universal examinations, but could still form the basis of this type of analysis. In many of these cases, national value added performance data could be compiled easily.

Robustness checks of the data would be valuable in each new context. For example, in Chile there is a particularly strong relationship between SES and examination scores, which may suggest the use of a more complex value added model with additional variables in this case (Thomas, 2015). However, in such situations, it will remain important to consider what type of value added model is achievable within the constraints of available data, and whether a simple value added model still provides a better signal of school performance than the alternative being considered by policymakers, which would normally rely on attainment results alone.

¹ Algeria, Barbados, Belize, Botswana, Costa Rica, Djibouti, Guyana, Jamaica, Kenya, Lesotho, Liberia, Malaysia, Mauritius, Mexico, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Thailand, Trinidad and Tobago, Uganda, Vietnam, Zambia and Zimbabwe.

- **Developing value added measures for primary schools**

Many governments have a greater policy focus on driving improvement in primary schools. Investigating how to develop and use more intelligent accountability measures for primary schools may therefore be of greater interest in some cases.

In the UK, value added performance measures are also created for primary schools. Teacher assessment results of 7-year-olds are, on average, good predictors of exam results of 11 year olds, showing that it is also important to control for prior attainment when judging a primary school.

The UK is unusual in having a national assessment system in lower primary, which can form the baseline for a primary school value added measure. However, it would be worth exploring if there are any other contexts in which value added measures of primary school performance could be created for a large number of primary schools. This could be through national examinations at lower primary, or large scale sample assessments, possibly including citizen-led assessments or the Early Grade Reading Assessment (EGRA). If these types of assessments could potentially be used, then research would be needed into the predictive validity of these assessments in relation to end of primary school examinations.

8. Bibliography

- Banerjee, A.V., Banerji, R., Duflo, E., Glennerster, R. and Khemani, S. (2010). Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India. *Am. Econ. J. Econ. Policy* 2, 1–30. doi:10.1257/pol.2.1.1
- Bruns, B., Filmer, D. and Patrinos, H.A. (2011). *Making Schools Work: new evidence on accountability reform*. Washington DC, The World Bank.
- Barber, M. and Mourshed, M. (2007). *How the world's best performing school systems come out on top*. McKinsey & Company.
http://mckinseyonsociety.com/downloads/reports/Education/Worlds_School_Systems_Final.pdf
- Barr, A., Mugisha, F., Serneels, P. and Zeitlin, A. (2012). *Information and collective action in community-based monitoring of schools: Field and lab experimental evidence from Uganda*.
- Burgess, S. and Allen R. (2010). *Evaluating the Provision of School Performance Information for School Choice*. Centre for Market and Public Organisation, Working Paper 10/241.
- Burgess, S., Wilson, D. and Worth, J. (2010). *A natural experiment in school accountability: the impact of school performance information on pupil progress and sorting*. CMPO Working Paper No. 10/246, Bristol, Centre for Market and Public Organisation.
- Banerjee, A., Banerji, R., Duflo, E., Glennerster, R. and Khemani, S. (2008). *Pitfalls of Participatory Programs: Evidence from a Randomized Evaluation in Education in India*. NBER Working Paper No. 14311, Cambridge, MA, National Bureau of Economic Research.
- Cervini, R. (2006). Learning progress in the secondary education in Argentina: A value-added multilevel analysis. *Rista Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, 4, 72.
- Chereau, B.M. and Thomas, S. (2015). Educational effectiveness in Chilean secondary education: Comparing different 'value added' approaches to evaluate schools. *Assessment in Education: Principles, Policy and Practice*.
<http://www.bris.ac.uk/education/people/35366/pub/53178383>
- Crawfurd and Elks (2016). *Value Added School Performance Measures in Uganda*. Ark, London.
- De Hoyos Navarro, R.E., Garcia Moreno, V.A. and Patrinos, H.A. (2015). *The impact of an accountability intervention with diagnostic feedback: evidence from Mexico*. Policy Research working paper; no. WPS 7393. Washington, D.C. World Bank Group.
<http://documents.worldbank.org/curated/en/2015/08/24903688/impact-accountability-intervention-diagnostic-feedback-evidence-mexico>
- Department for Education (2012). Secondary school accountability consultation. Department for Education London.
<https://www.gov.uk/government/consultations/secondary-school-accountability-consultation>
- Hanushek, E.A. and Raymond, M.E. (2005). Does School Accountability Lead to Improved Student Performance? *Journal of Policy Analysis and Management*, 24 (2), 297-327.

Hastings, J.S. and Weinstein, J.M. (2008). Information, School Choice, and Academic Achievement: Evidence from Two Experiments. *The Quarterly Journal of Economics* 123 (4), 1373-1414.

Joshi, A. (2013). *Do They Work? Assessing the Impact of Transparency and Accountability Initiatives in Service Delivery*. Development Policy Review, 31, 29-48.

Kane, T. and Staiger, D.O. (2002). The Promise and Pitfalls of Using Imprecise School Accountability Measures. *J. Econ. Perspect.*

Koedel, C., Mihaly, K., Rockoff, J.E., 2015. Value-added modeling: A review. *Econ. Educ. Rev.* doi:10.1016/j.econedurev.2015.01.006

McCaffrey, D.F., Sass, T.R., Lockwood, J.R. and Mihaly, K. (2009). The Intertemporal Variability of Teacher Effect Estimates. *Education Finance and Policy* Fall 2009, Vol. 4, No. 4, Pages 572-606.

Ministry of Education and Sports (2015). Education, Science, Technology and Sports Performance Report. Kampala.

[http://www.education.go.ug/files/downloads/pRint%20ESSAPR%20FY%202014-15%20%20Prefinal%209\(1\)%20-%20final.pdf](http://www.education.go.ug/files/downloads/pRint%20ESSAPR%20FY%202014-15%20%20Prefinal%209(1)%20-%20final.pdf)

Mizala, A., Romaguera, P. and Urquiola, M. (2007). Socioeconomic status or noise? Tradeoffs in the generation of school quality information. *J. Dev. Econ.* 84, 61–75. doi:10.1016/j.jdeveco.2006.09.003

Muñoz-Chereau, B. (2013). *Value added measures of school performance in Chile*. PhD thesis. Bristol: University of Bristol.

Muralidharan, K. and Sundararaman, V. (2010). The impact of diagnostic feedback to teachers: experimental evidence from India. *The Economic Journal*, Volume 120 F107-F203.

OECD (2013). *PISA 2012 Results: What Makes Schools Successful? Resources, Policies and Practices (Volume IV)*. Paris, OECD Publishing.

Ofsted (2015). *School Inspection Framework 2015/16*. Ofsted, London.

Paterson, C. (2013). *Measuring What Matters*. Centre Forum. <http://www.centreforum.org/assets/pubs/measuring-what-matters.pdf>

Pandey, P., Goyal, S. and Sundararaman, V. (2008). *Community Participation in Public Schools – The Impact of Information Campaigns in Three Indian States*. Policy Research Working Paper 4776, Washington DC, The World Bank.

Pritchett, L. (2015). *Creating Education Systems Coherent for Learning Outcomes: Making the Transition from Schooling to Learning*. *Research on Improving Systems of Education (RISE)*.

Results for Development (2015). *Bringing Learning to Light: The Role of Citizen-led Assessments in Shifting the Education Agenda*. Results for Development Institute. http://r4d.org/sites/resultsfordevelopment.org/files/resources/Bringing%20Learning%20to%20Light_English.pdf

9. Annex A. PEAS School X: 2014 Value Add Report

1. Introduction to value add

For the first time in 2015, PEAS has been able to compare the academic progress made by students in PEAS schools with the progress made by students of similar capabilities in non-PEAS schools. This measure, called 'value add', uses students' primary leaving exam (PLE) scores to predict their expected scores at UCE. The model then compares students' actual UCE results with their predicted results to assess whether the school has helped students to perform better or worse than was expected given their prior attainment.

An example of how the model works is included below:

Student Name	PLE Score	UCE Score Predicted	UCE Score Actual	Value Add Score
Student A	15	48	37	+11
Student B	8	32	35	-3

Value add is an important measure of academic progress because it enables schools to:

- assess whether the school is helping students of all backgrounds and capabilities to improve
- compare the school's exam results with other schools' results on a fair scale that accounts for the academic potential of the student intake.

A value add score of +2 or higher is considered to be statistically better than the national average in Uganda. A value add score of -2 or lower is considered to be statistically worse than the national average. This paper summarises School X's value add results from the 2014 UCE exams.

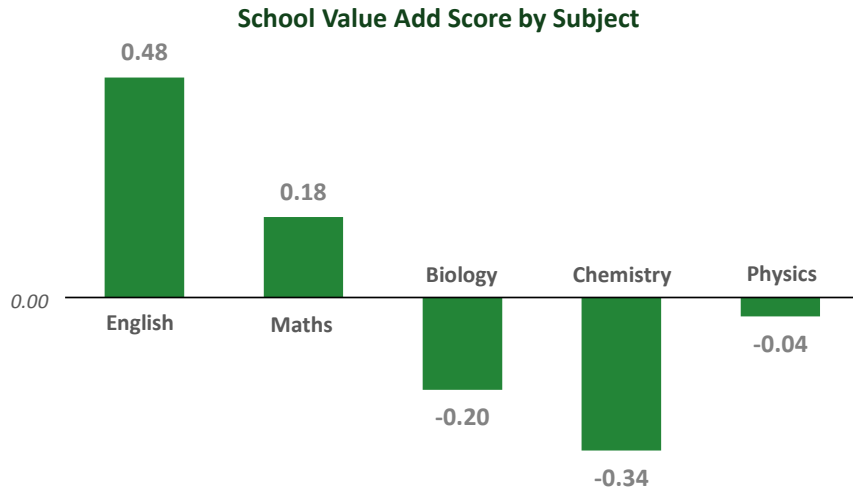
2. School performance against network and national average

Across all students who sat UCE exams in 2014, School X had an average value add score of **+3.44**. This means that School X students on average scored 3.4 points better than predicted in their UCE exams. This result is statistically better than the national average, and above the PEAS network average of +2.21.

3. School performance by subject

While School X is helping students to achieve better overall UCE scores than they would in other schools in Uganda, the school is better at teaching some subjects than others. The strongest subject at School X is English, where the school helps students to get UCE subject scores that are 0.45 points better than predicted, followed by maths, where students get scores that are 0.18 points better than predicted.

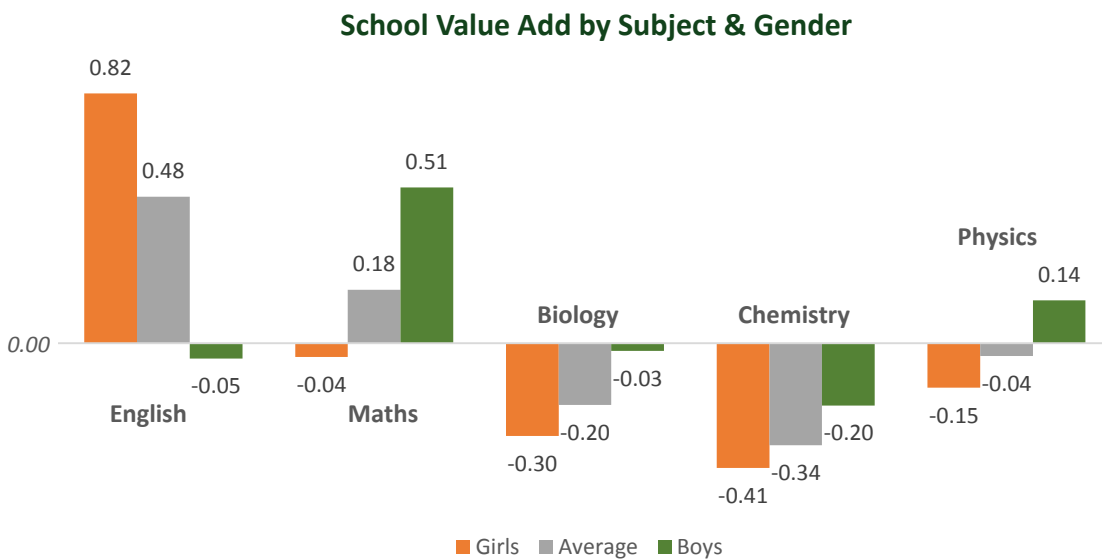
However, the school actually negatively impacts students' scores in the core science subjects of Biology, Chemistry and Physics. In these subject areas, students are actually doing worse than predicted, as the school average value add score for each of the science subjects is negative.



4. School performance by gender

While School X is helping both boys and girls to make positive progress, the school is more successful at helping boys improve their academic attainment than girls. On average, boys perform +4.08 points better in their UCE exam scores than predicted, while girls only perform +3.03 points better than predicted.

The table below summarises average value add scores broken down by subject and by gender. As demonstrated, the school is strongest at helping girls improve their attainment in English – in this subject, girls actually achieve exam results that are nearly a full point (+0.82) better than predicted. However, in all other core subjects, the school is stronger at teaching boys than girls. For example, in maths, girls do worse in their UCE exams than predicted, while boys do better than predicted.



Questions for discussion:

What are your top 2-3 findings from your school's results?

What might explain the performance differences by subject?

What might explain the performance differences by gender?

What would you focus on to improve your school's overall value add results next year?

About

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For any further enquiry, please contact info@heart-resources.org

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