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Young Lives

Learning Motivations, Learning Outcomes and Gender in Vietnam

Obiageri Bridget Azubuike and Angela W. Little

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Summary

This working paper uses the 2016-17 Young Lives school survey data in Vietnam to examine learning outcomes and learning motivations for boys and girls in Grade 10. It examines how differences in learning motivations impact on learning outcomes and future expectations, and also examines the determinants of these differences and their relationships with student's background and prior learning attainment.

The findings reveal that girls are approaching their studies with more discipline and diligence than boys on average. In general, girls demonstrate more of the favourable traits and attitudes to learning. The findings also indicate that, on average, girls are doing better in both maths and English and making better progress. However, their superior performance in mathematics isn't robust enough to remain in their favour in more sophisticated analysis. Even though girls are on average doing better in maths, their beliefs about their maths abilities are low. Boys tend to have higher confidence in their maths abilities. The paper highlights four areas requiring attention in research and policy discussions on gender equity in Vietnam: how to raise girls' self-concepts in maths; how to increase interest-oriented learning and reduce assessment-oriented learning; how to raise boys' motivations for learning in general; and, through them, how to increase boys' performance in English language and problem-solving.

About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in four countries (Ethiopia, India, Peru and Vietnam) over 15 years. **www.younglives.org.uk**

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1. Introduction

The guiding principles of gender relations in Confucianism have long affected gender norms in Vietnam and defined women's roles in traditional Vietnamese society. Men and women were expected to have distinct social roles: men were to go out to work to support the family and women were to stay at home as caregivers (Gao et al. 2012). The criteria defining women's place in the society were defined by the 'three subordinations criteria': be subordinate to her father before marriage, to her husband after marriage, and to her son in widowhood. As attributes of traditional Confucian values began to disappear, the spread of communist ethics over the past decades have celebrated both the productive and the reproductive roles of women. Women's status has been elevated and there is evidence that more women are attaining higher levels of education and aspiring for better career opportunities than earlier. However, there are still traces of Confucian values engrained in the fabric of Vietnamese society, stressing the role of women as 'the bearers of the ideal family' (Gao et al. 2012 and Rydstrøm 2010, cited in Zharkevich et al. 2016).

The role of Vietnamese women in modern society is influenced by communist values and the legacy of Confucian ideals. Zharkevich et al. (2016: 9) posit that:

> Communist ideals of women as productive workers in the national economy have been layered on top of Confucian values that emphasize women's domestic roles, producing a gender ideology that requires women to shoulder responsibility in multiple domains of life, without necessarily having the corresponding powers of decision-making or status within the family and patriline.

In addition to these gender norms and traditional roles of women that still play a strong role in modern Vietnamese society, are the Doi Moi ('Renovation') economic and social reforms which were pronounced in 1986 in which education would play a key role in the shift from a centrally planned economy to a socialist-oriented market economy. The Doi Moi reforms led to rapid economic growth and the elevation of Vietnam to middle-income status in 2010. It is now generally recognised that education played an extremely important role in promoting structural change: 'Those born in the period following the Doi Moi reforms have attained higher levels of education than any other generation in the country's history' (Bodewig et al. 2014).

As a result, young people in Vietnam are highly committed to study and value education above all, but also strive to uphold family values. Now women are seen as the upholder of family values but are also pursuing education, equality of opportunities and career choices. However, some inequalities still exist as young people transition from school to the workplace. When deciding post-secondary school subjects of specialisation, students' decision-making is still influenced by gender norms, according to which the proper place for women is in administrative or care work (Zharkevich et al. 2016).

Using Young Lives qualitative research data, Zharkevich et al. (2016) reveal that female students still find themselves discriminated from certain career opportunities despite their strong desires to pursue these opportunities. One participant of the qualitative survey is documented to have:

> … successfully passed exams to the Police Academy with the highest grades and should have been able to choose any field of specialization, ranging from criminal policing to traffic control. Yet, in practice the university assigned her to the economic

> crimes' investigation field without her consent, even though she had really wanted to study traffic policing (Zharkevich et al al. 2016: 29).

In the female participant's own words:

> "We study the same things with the boys, we study everything, but the boys get to be outside, and we stay inside to do paperwork. Everyone can do paperwork – I don't like it."

The researchers also found further evidence that gender norms are regulating social activities pursued by young people in their teens and early twenties, finding that boys have the upper hand in the unions which are associated with the structure of the Communist Party of Vietnam and the various committees that are crucial for future career development (Zharkevich et al. 2016).

These issues set females on a track to strive hard in school and put in more effort because they feel obligated to prove that they hardworking and upright members of society, who should uphold good family values and value education at the same time. Girls are to 'study actively, work creatively, raise children well and build happy families' (Schuler et al. 2006: 386).

Recent literature has shown that girls are performing better in academic achievement than boys in Vietnam. In the 2015 OECD-PISA studies of reading literacy, girls in Vietnam performed better than boys with a statistically significant difference of 25 points, where the OECD average across all countries was 27 points higher for girls. In science literacy girls performed better than boys with a non-statistically significant difference of 3 points, where the OECD average was 3.5 points in favour of boys. And in maths girls performed better than boys with a non-statistically significant difference of 3 points, where the OECD average was 8 points in favour of boys (OECD 2015/16).

Yet, as described above, girls are also likely to be discriminated in the labour market, and they may be motivated by societal expectations and working harder to have access to the career opportunities that they desire. The question that arises is why are girls outperforming boys in a societal context where girls are expected to uphold family values and are discriminated against in the labour market? Could it have anything to do with the motivations of boys and girls to learn?

This working paper focuses on the relationship between learning motivations and learning outcomes, using educational assessments to provide insights into the gender issues and their implications. The question of what explains the higher performance of girls in many educational assessments in Vietnam (and in a number of other countries) by comparison with the opposite pattern elsewhere has been insufficiently explored, and this paper makes a useful contribution to addressing this knowledge gap.

2. Learning outcomes and gender in Vietnam

Vietnam is a large country with a population of more than 90 million, which includes 54 ethnic minority groups. The majority group (Kinh), account for 86% of the population. Vietnamese is the language of the majority and the official language. Vietnam inherited from China a system of recruiting top civil servants through performance in meritocratic competitive examinations

established in Vietnam (Nguyen 2014). In the late 1990s Loan (2000) identified that while enrolment rates between girls and boys were similar, in general enrolment differences in favour of boys were found among ethnic minorities and children living in the greatest poverty. Women were under-represented in technical and professional training and work, and over-represented in pedagogy and social sciences. School textbooks were singled out as reinforcing gender stereotypes in the workplace.

Over the years, successive waves of education reform appear to have resulted in a very 'productive' education system. As noted above, 15 year olds in Vietnam performed at a very high level in the Program for International Student Assessment (PISA) surveys of 2012 (OECD 2013), a level of performance that was repeated in the PISA survey of 2015. The Young Lives surveys show similar results. Rolleston (2014) examines trends in cognitive skill development from the ages of 5 to 15 in Vietnam, Ethiopia, Peru and the state of Andhra Pradesh in India. Large differences in learning and learning progress are found between the four education systems, with 'learning gains' typically being highest in Vietnam. Gender is not a common construct in education research and policy development in Vietnam (Loan 2000). Educators and writers of educational material are not sensitive to the role of gender stereotypes in textbooks, and the approval of official textbooks, by a specialised textbook appraisal committee, considers only pedagogical and not gender issues.

Despite the apparent non-privileging of gender in education policy, there are marked gender differences in the learning outcomes of girls and boys, a difference that favours girls. In this, Vietnam is following a trend found in an increasing number of middle and high-income countries.

Evidence from the Young Lives surveys in Vietnam corroborates these findings. In 2011-12, Grade 5 girls outperformed boys in Vietnamese and maths tests administered at the beginning and end of the school year. While the gender difference between test scores in Vietnamese was significant, the difference between scores for boys and girls in maths was not significantly different from zero (Rolleston et al. 2013). Findings from the 2016-27 school survey conducted at Grade 10 show girls outperforming boys significantly in both maths and English language tests at the beginning and end of the school year. Nguyen and Griffin (2011), using a 2007 nationally representative dataset of Grade 5 student achievement in reading and mathematics, found similar results. When they estimated mean scores, girls outperformed boys in both maths and reading, but in a regression estimation the difference in maths performance is not found to be significant. This paper aims to explore whether, in the context of contemporary secondary education in Vietnam, there is a link between learning motivations, gender and learning outcomes. We turn now to the analysis to answer the following questions:

1. Are there differences in learning outcomes between Grade 10 boys and girls?
2. Are there differences in learning motivations between Grade 10 boys and girls?
3. Are differences in learning motivation related to learning outcomes?
4. What determines the differences in learning motivation and outcomes among boys and girls?

3. Determinants of academic performance in Vietnam

Rolleston (2014) demonstrates how, in Vietnam, the learning gaps between groups of children are well established by Grade 5. Student scores at the beginning of the school year are predictive of later scores, related in part to their household background and early schooling, underlining the importance of focusing on children's learning in the early years to improve learning overall. Differential progress appears to be made by students during Grade 5 primary. More socially advantaged pupils tend to make slightly more progress, but there is also encouraging evidence of relative catch-up by minority ethnic groups in relation to the Grade 5 curricula. Some schools and classes make a bigger contribution than others to how children learn. These effects can be large, and greater than the differences in the gains made between social groups.

Key factors that emerge as important to consider at the school and class level include better facilities (including separate classrooms and working electricity), teachers who have a degree, and teachers who feel equipped to positively affect the learning of their students (Rolleston et al. 2013). Rolleston and Krutikova (2014) explore these findings further by looking at the relationships between home background, teacher, peer and school factors and learning progress in Grade 5. Disadvantaged pupils receive relatively equitable access to a range of minimum standards. However, differences are apparent in the number of hours of instruction received, 'extra classes', and learning resources such as computers, the internet and books. Analysis of correlates of attainment suggests that some of these are likely to constitute an important part of the explanation for the persistence of learning inequalities by home background in Vietnam, suggesting that following success in equalising basic inputs, policy attention should turn more directly to boosting wider 'opportunities to learn' among disadvantaged pupils. Neither of these studies explored the differential progress of girls and boys separately.

4. The 'non-cognitive' domain and leaning outcomes

One possible line of enquiry in the explanation of gender difference is to explore whether, other things being equal, girls display more self-confidence, higher levels of effort, stronger motivations and more positive attitudes to learning than boys. Suggestive findings from the Young Lives 2011-12 school survey indicated that girls displayed higher academic confidence and academic effort than boys in Grade 5 (Rolleston et al. 2013). In this paper we explore this line of enquiry in depth.

Academic confidence and academic effort are examples of a large cluster of motivations, attitudes, skills, strategies and behaviours often referred to collectively as 'non-cognitive skills' or 'soft skills' (Little 2017). The 'non-cognitive' terrain is extensive and has been of longstanding interest to psychologists. Motivation was the cornerstone of one of the founding fathers of psychology, William James, in the late nineteenth century (James 1890). Since

then a number of twentieth-century psychologists have focused on the links between motivations, aspirations and emotion, and academic achievement (for example, see Maslow 1943; McClelland 1976; Bandura 1982). However, during the last 20 years economists have shown an increasing interest in the non-cognitive domain (for example, see Bowles, Gintis and Osborne 2001; Borghans et al. 2008; Heckman and Rubenstein 2011). While psychologists tend to focus most (but not all) their attention on learning outcomes, economists focus on labour market outcomes. Economists' interests in the non-cognitive domain is also reflected in the work of powerful international agencies such as the World Bank, around which much of the current discourse on 'soft skills', personality traits, life skills and twenty-first century skills revolve.[1]

The term 'non-cognitive' is placed in inverted commas since it is clear that the boundary between the non-cognitive and cognitive psychological domain is blurred, and that many attitudes and psychosocial factors often described as belonging to the non-cognitive domain of functioning involve cognitive processing (e.g. self-beliefs, expectancy of future performance, self-concept). In their review of the literature on non-cognitive skills and outcomes for young people, Gutman and Schoon (2013) conclude that there is evidence of strong associations between non-cognitive skills and positive outcomes. Measurable factors such as self-control and school engagement are correlated with positive future outcomes such as good exam results, stable finances and reduced likelihood of criminal activity. However, robust evidence of their causal impact on long-term outcomes is much more limited. A number of non-cognitive skills have been identified and their impact on academic outcomes recognised, but it remains difficult to establish a purely causal link between these skills and academic success, even though there is a general consensus of a positive relationship. Some of the non-cognitive skills reviewed in a vast and growing literature include motivation, effort, self-regulated learning, self-efficacy, academic self-concept, anti-social and pro-social behaviours, coping and resilience (for other recent meta literature reviews see Farrington et al. 2014; Rosen et al. 2010; Duckworth et al. 2009; Rankin et al. 2015; Little 2017). None reports gender differences in the non-cognitive domain – although it is not clear whether there have been no gender differences in the studies cited or whether they have not been explored by the study authors.

To date there has been relatively little research on the non-cognitive domain in Vietnam. Yorke (2013), using Young Lives data, explores psychosocial skills in Vietnam, with particular attention to academic self-confidence. A recent impact evaluation of an innovative education programme in Vietnam based on the principles of the Escuela Nueva Programme from Latin America explored the cognitive and non-cognitive outcomes of studies in a comparison of treatment and control primary schools (Parandeker et al. 2017). Grade 3, 4 and 5 girls performed better in Vietnamese and maths. They also performed better than boys on a survey measure of behavioural development (intrapersonal, social, ethical and community, based on parental opinion) and on qualitative classroom observation measures of leadership, teamwork, communication and self-managed learning. In the work and employment domain, Bodewig et al. (2014) predict a shift in labour demand away from manual and elementary jobs and towards more skill-intensive non-manual jobs requiring social and behavioural skills, such as working well in teams and being able to solve problems.

1 For the case of Vietnam, see Bodewig et al. (2014).

We also note that measures of non-cognitive outcomes usually rely on expressed motivations and attitudes and are subject to response bias, especially that of social desirability, and it may be that some groups are subject to expressions of social desirability more than others. So, alongside our measures of motivations and attitudes, we include reports of behaviours such as attendance at private tuition, hours spent on homework and teacher reports of student participation in class.

5. Young Lives data and methodology

Young Lives is a longitudinal study of childhood poverty in Ethiopia, India (the states of Andhra Pradesh and Telangana), Peru, and Vietnam. It has followed a total of 12,000 children over the course of 15 years. The Young Lives sample is divided into two age cohorts, an 'Older Cohort' born in 1994-95, and a 'Younger Cohort' born in 2001-02. The sample consists of about 3,000 children in each country, with 2,000 children from the Younger Cohort and 1,000 from the Older Cohort. In all four countries, a sentinel-site sampling design is employed, comprising 20 purposively selected sites chosen to represent national diversity, but with a pro-poor bias. To date, five rounds of data collection have been completed, each of which has gathered detailed information on the background characteristics of each child, household, and community.

In 2010, Young Lives introduced a series of school surveys in each country to explore in more depth the role which formal schooling had to play in the lives of Young Lives children and their peers (Boyden and James 2014). Between 2010 and 2013 the school surveys examined issues of school quality and effectiveness in primary schools in Young Lives sites in Ethiopia, India, Peru and Vietnam. In 2016-17, Young Lives conducted a further round of school effectiveness surveys in Ethiopia, India and Vietnam. Building upon the design of the primary school surveys, the 2016-17 school surveys examined school effectiveness at upper primary level in Ethiopia, and at secondary level in India and Vietnam.[2]

In Vietnam, the 20 sites are clustered in five provinces: Lao Cai, Hung Yen, Da Nang, Phu Yen and Ben Tre.[3] Each province contains four sites, and each site is formed of one or two communes, totalling 36 communes within 14 districts. The 2016-17 school survey was conducted at all upper secondary schools in the 14 Young Lives districts: 52 schools with 8,740 students in Grade 10. The school survey included three cognitive tests (maths, functional English and transferable skills tests) to assess student learning over the course of one school year, along with a range of background instruments designed to contextualise findings on learning outcomes.[4] The maths and English tests were administered at the beginning of the school year (Wave 1) and at the end of the school year (Wave 2).[5]

2 For further details about the survey designs in each country, see Rossiter (2016); Moore (2016); Iyer (2016).

3 See Rolleston et al. (2013) for a detailed description of the Young Lives sites in Vietnam.

4 See Azubuike et al. (2016) for details on the design of the maths and English tests used in the analysis.

5 See Iyer (2016) for more details on the 2016-17 school survey design and implementation in Vietnam.

We employed descriptive analysis to examine the mean differences in the cognitive tests and non-cognitive scales between boys and girls, and the significance of the differences. We used correlation analysis to explore the pairwise relationship between the non-cognitive scales and the cognitive tests. Lastly, multiple regression analysis was used to examine determinants of student's achievement in maths, functional English and problem-solving. The regression analysis employed here is the fixed effect regression analysis. In estimating the effect of non-cognitive skills on learning outcome we use a classroom-fixed effect regression so that student's estimates are only comparable to their peers in the same class. This allows us to examine the effect of student characteristics on their performance on the maths and English tests holding classroom effects fixed, so we are comparing students only with their peers in the same classroom. In this case, we are holding all observable and unobservable effects at classroom level fixed so that we will avoid any omitted variable bias, especially those we can't observe within classes. Using the 'class fixed effects' means that the results reported are 'average within class effects', that is, as if a regression had been conducted for each class separately and then the results averaged over all the classes in the sample.

6. Analysis and results

6.1. Gender differences in student learning motivations

Table 1 shows the mean scores of students on psychosocial scales and cognitive tests in English and maths. The scores on the psychosocial scales have been estimated from the student's responses on a four-point Likert scale ('strongly agree', 'agree', 'disagree' and 'strongly disagree'). Each student responded to a set of questions that make up each scale (see Appendix 6). The scores for the psychosocial scales were estimated using Item Response Theory (IRT) - Graded Response Model (IRT-GRM).[6] IRT estimates the extent to which the person possesses the latent trait, with a higher number meaning they have more of the trait. The standardised score predicted from the IRT estimation was scaled to a mean of 500 and standard deviation of 100.

The *future orientation scale* describes the student's motivation to study in line with their expectations for the future; higher scores on the scale indicate positive attitudes towards learning in school to improve future outcomes. The *low academic self-confidence scale* refers to academic ability more generally and focuses on low levels of confidence; higher scores on the scale indicate *lower* confidence in their academic abilities. The *effort scale* measures students' effort in their studies in general and how much work they invest in learning and succeeding at school; higher scores on the scale indicate higher effort in their studies. The *personal development scale* describes a desire to learn for personal improvement and development; higher scores on the scale indicate higher pursuit of personal development. The *self-concept scales* in maths and English refer to the student's beliefs about their abilities in maths and English; higher scores on the scales indicate more positive beliefs about their academic abilities in the subject. The *assessment domination scales* are subject-specific and

6 IRT-GRM models item response behaviour as a function of data types that are not only limited to binary responses. In the GRM, item responses are categorical and ordered, for example, 'poor', 'good', and 'excellent' or 'strongly disagree', 'disagree', 'agree', and 'strongly agree'. See Stata 2017 www.stata.com/manuals/irtirtgrm.pdf (accessed 21 June 2018).

measure the extent to which the student believes they are motivated to learn more by the need to pass examinations than by the interest and enjoyment of the subject. Higher scores on these scales indicate the dominance of assessment over interest/enjoyment; lower scores indicate the dominance of interest/enjoyment over assessment. All the scales were analysed for internal reliability using the Cronbach alpha's test (see Appendix 7) and all negative items were reversed prior to analysis.[7]

Table 1. *Mean scores for student responses on psychosocial scales and cognitive tests by gender*

Psychosocial scale	Mean female	Mean male	Significance of difference
Future orientation (FO)	507	494	***
Low academic self-confidence (LAC)	498	501	-
Effort (EFT)	506	495	***
Personal development (PD)	505	496	***
Self-concept of maths (SCM)	492	509	***
Self-concept of English (SCE)	509	491	***
Assessment domination maths (ADM)	497	502	**
Assessment domination English (ADE)	485	515	***
Wave 1 English	520	480	***
Wave 2 English	520	481	***
Wave 1 maths	506	495	***
Wave 2 maths	508	493	***
Observation	4240	4185	

Notes: *** p<0.01, ** p<0.05, * p<0.1.

Females in the sample on average report having higher future orientation, higher effort in their academic studies, a higher level of personal development as a motivation for learning, and more positive self-concept in English. On the other hand, male students report more positive self-concept in maths and a higher level of assessment dominance in their motivation to learn. All the scales, except the academic self-confidence scale, reveal significant differences between average scores reported by the male and female students in the sample. In the maths and English tests administered to students at the beginning and end of the school year, on average female students scored higher on both tests.[8] However, male students had lower scores in the second wave of the tests, while female students' scores improved at wave 2, suggesting that girls made more progress on the test.

7 'Cronbach's alpha provides an indication of the average correlation among all items that make up the scale. Cronbach's coefficient alpha evaluates the degree to which different items "pull together" the same content area – and therefore provide a reliable estimate of the individual's underlying trait of interest. The alpha values range from 0 to 1.00, with higher values indicating greater internal consistency (Krishnan 2013). Generally, a Cronbach's alpha of 0.7 or above is accepted as a threshold for scale reliability' (Little and Azubuike 2017: 8-9).

8 Students' raw scores on the maths and English tests were analysed using a two-parameter item-response theory (IRT 2pl). The IRT 2pl model estimates student's latent ability on the test and takes account of item difficulty and discrimination between students. Similar to the psychosocial scales, the cognitive test scores were scaled to have a mean of 500 and standard deviation of 100.

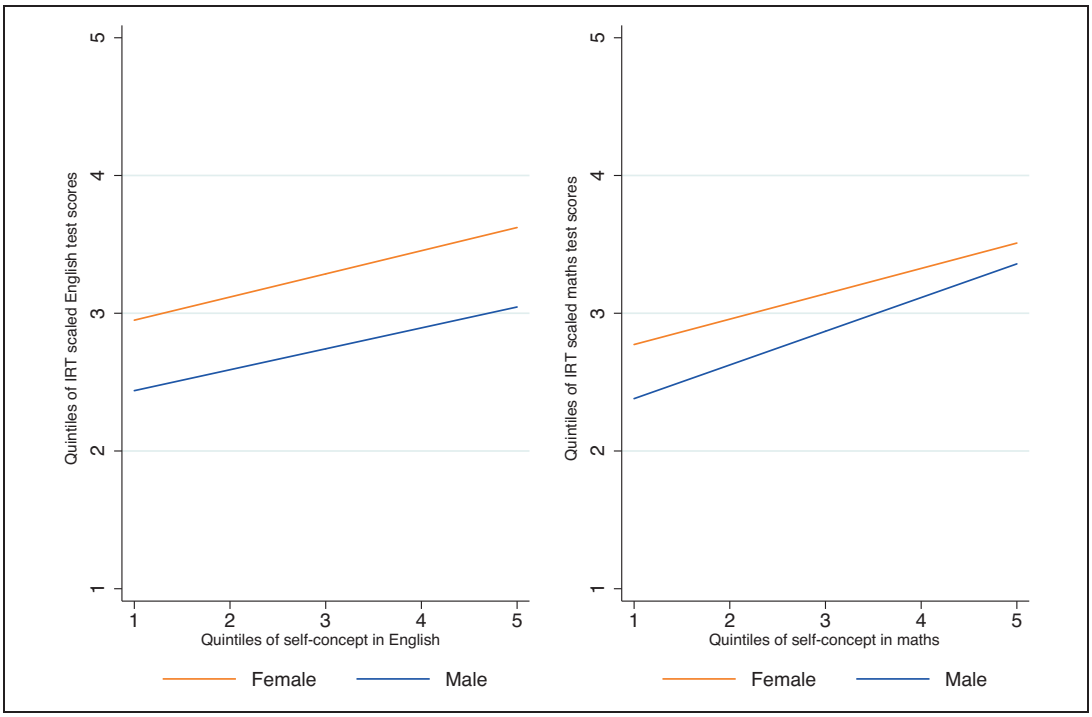
6.2. Learning motivations and learning outcomes

Appendix 1 presents the pairwise correlation of student scores on the psychosocial scales and their scores on the maths and English language tests. The signs of the correlations between the psychosocial scales and the cognitive tests are as expected. Appendix 1 shows that the linear relationship between the student's cognitive tests and psychosocial skills are low. However, the assessment domination scale and self-concept scale show a consistent pattern across the two subjects and a higher correlation than any other psychosocial scale. Hence, we focus our analysis on the self-concept and assessment domination scales.

Higher self-concept in both maths and English show a statistically significant but weak positive relationship with performance on the cognitive tests in maths and English. Similarly, assessment domination is negatively related to performance on the cognitive tests in maths and English, that is, students who report being motivated by exam performance have lower test scores than those who report being motivated by personal interest in their subjects. Appendix 1 also shows that students who have a higher self-concept of their abilities are less likely to be motivated by exam performance. This is consistent for both maths and English, as seen in the moderate linear relationship between assessment domination and self-concept in both subjects. Academic effort, future orientation, academic confidence and personal development all show very weak relationships with the students' performance on both tests. Hence for our main analysis we focus on the relationship between self-concept, assessment domination and test scores.

Figure 1 presents the linear relationship between self-concept and test scores in English and maths.

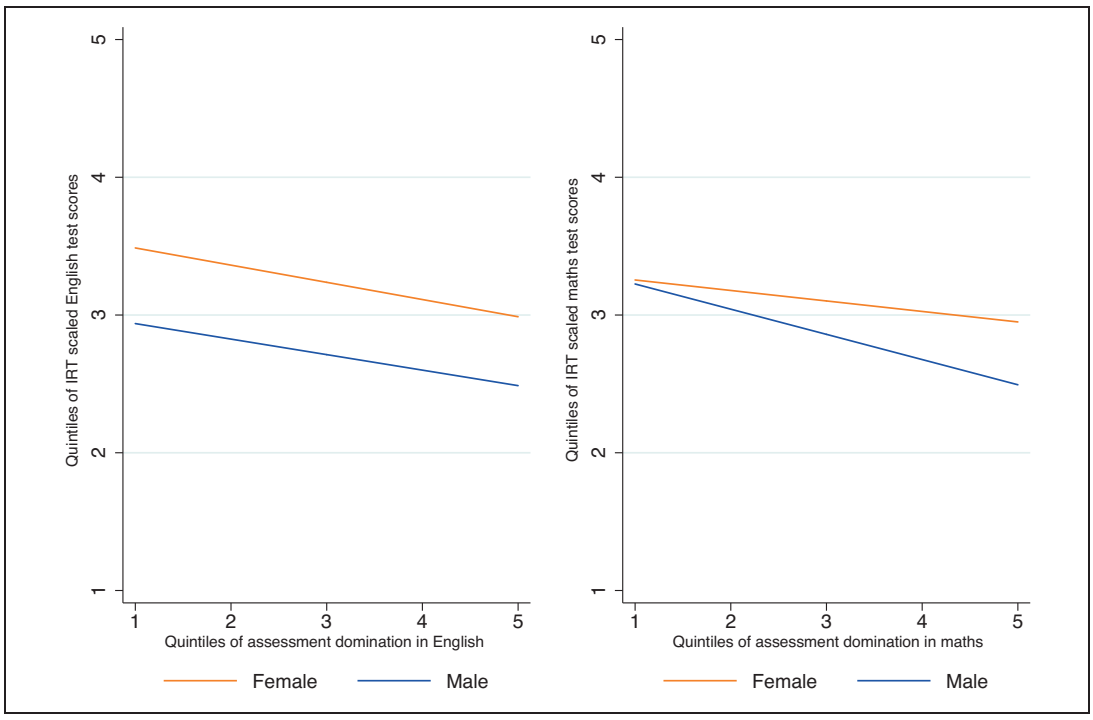
Figure 1. *Linear relationship between self-concept scales and test score by gender*



The orange line represents female students in our sample, while the blue line represents male students. While there is a positive relationship between a student's self-concept in the subject and the student's score on the test for both females and males, female students score higher on average on both the English and maths test. But even at similar levels of self-concept, females still score higher on the tests, more so in English. We can also see that the slope of the relationship between self-concept and performance on the English test for male and female students is parallel, such that at all levels of student's self-concept the gaps between male and female scores on the English language test are the same. In the maths test on the other hand, at lower levels of self-concept, female students score much higher than their male counter-parts in maths. As self-concept increases the gap narrows between male and female students scores in maths. We saw in Table 1 that females scored significantly higher than males on average in maths, but male students had higher self-concept scores on average, hence male students with higher self-concept scores narrow the gap in the maths test score between males and females.

Similarly, we can assess the relationships between the assessment domination scale and maths and English test scores between male and female students (Figure 2).

Figure 2. *Linear relationship between assessment domination scales and test score by gender*



Assessment domination is negatively related to performance on the maths and English language tests. The slope of this relationship is different in English and maths. At similar levels of assessment dominance, female students on average score higher in both English and maths. In maths, however, both male and females have similar scores at the lower end of the assessment dominance quintile but at higher levels of assessment dominance, male students score lower.

6.3. Learning outcomes, learning motivation and student characteristics

In Table 2, we employ a regression analysis to examine the relationship between students' performance and their score on the self-concept and assessment domination scale in both maths and English language tests, when other factors are controlled. We control for a range of background factors like gender and parental literacy, time on task (e.g. days absent, time spent on homework, student participation in class) and student's lag test score in maths and English (value-added model).[9] The outcome variable here is student's maths and English test score, the test administered at the end of the school year in wave 2 (W2) of the school survey.

Student's self-concept in a subject is likely to be influenced by how they judge themselves in relation to their peers within the same classroom, so we examine this relationship in a class-fixed effects regression model. We report the full regression in Appendix 2. Table 2 is an abridged results table that focuses on the students' lag test score, gender and academic non-cognitive skills, and student's time on task (e.g. hours spent on home work and class participation).

Table 2. *Academic non-cognitive skills and student achievement in maths and English*

Variables	English performance (W2)
Lag English score (W1)	0.336***
	(-0.0128)
Gender (male)	-7.213***
	(-1.627)
Self-concept in English	0.0682***
	(-0.00901)
Assessment domination in English	-0.0195**
	(-0.00891)
Hours spent on English homework	3.446***
	(-1.08)
Student participation in English	0.797*
	(-0.448)

Variables	Maths performance (W2)
Lag maths score (W1)	0.406***
	(-0.0124)
Gender (male)	1.314
	(-1.592)
Self-concept in maths	0.0860***
	(-0.00881)
Assessment domination in maths	-0.00952
	(-0.00852)
Hours spent on maths homework	0.645
	(-1.16)
Student participation in maths	0.884**
	(-0.423)

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

In both the maths and English value-added models, the self-concept scale shows a positive statistically significant effect on the students' performance on both the maths and English test.[10] The assessment domination scale has a negative effect on performance in maths and English, suggesting that students who are interested in what they are learning and are not dominated by assessment, score higher. This relationship reaches statistically significance for the English test. In separate analysis (not reported here), we included the other learning motivation scales such as effort, personal development, future orientation and low academic self-confidence (see Appendix 1 for pairwise correlations among the scales). Their effect on

9 The lag test score is the student's performance on the test which was administered at wave 1 of the survey at the beginning of the school year.

10 Value-added model here represents the regression analysis that includes wave 1 test scores as one of the determinants of student test score in wave 2.

the student's test score were either not statistically significant or not robust to the inclusion of other regressors in the model.

Table 2 also demonstrates that gender has a significant effect on English performance, with girls performing better than boys in both the value-added and non-value-added model (Appendix 2). In maths males performed better than females in the non-value-added model. However, this effect loses statistical significance in a value-added model, which shows that the average differences in mean scores between male and female students are not robust to the inclusion of other controls, which suggests that mean analysis is not sufficient to base our conclusions on.

When we examine the gender differences in self-concept in English and maths, females on average scored higher on the self-concept scale in English, and when we control for individual and household factors their score on the English test remains statistically significant. On the other hand, in maths, male students scored higher on the self-concept scale but are not actually performing higher on the maths test.

Also, we can see from Table 2 that hours spent on English homework is positively and significantly associated with higher achievement, but this is not the case for hours spent on maths homework. However, a student's participation in maths class (as reported by the teacher) is positively and significantly associated with the student's performance on the maths test.

6.4. Assessment domination and student's problem-solving achievement

The assessment domination scale is of some interest because, in contrast to all other scales employed, it examines preferences and choices. Students are invited to express the *relative* importance they attach to assessment and an interest in the subject as a motivation for learning. It is also of interest for its relevance to a thesis advanced over 40 years ago – the 'Diploma Disease' – which asserted that a dominance of assessment over an interest in the subject in children's learning could lead to 'surface learning', a stifling of curiosity, and an undermining of learner autonomy and interest in problem-solving in the future (Dore 1976; Little and Singh 1992). The thesis was controversial in its day and while some research explored its relationships with other types of motivation, its links with gender and academic achievement, and in particular problem-solving, were never explored. This Young Lives research offers us this possibility since, in addition to scores in maths and English, students sat problem-solving tests.

We therefore extend our analysis and explore determinants of students' problem-solving abilities in a multiple regression analysis. Table 3 reports the determinants of student's problem-solving score using similar controls included in Appendix 2. We report the estimates for students' prior test score, gender, self-concept in maths, assessment dominance in maths, hours spent on homework and student participation in maths class (reported by teacher). The outcome variable which measures student's problem-solving skills was developed as part of the transferable skills tests using the paper-and-pen format of the PISA 2003 problem-solving assessment, which was suitable for Young Lives study contexts.[11]

11 See Iyer and Azubuike (2017) for the design and implementation of the problem-solving tests in the Young Lives school survey.

Table 3. *Academic non-cognitive skills and student achievement in problem-solving*

Variables	Problem-solving score
Score on W1 maths test	26.59***
	(1.747)
Gender (male)	-18.78***
	(2.348)
Self-concept in maths	5.623***
	(1.497)
Assessment domination in maths	-2.775*
	(1.557)
Hours spent on maths homework	0.142
	(1.717)
Student participation in maths	1.162*
	(0.608)

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Students' abilities in maths are positively associated with their score on problem-solving. Being female and having a higher self-concept in maths increases a student's problem-solving abilities. Assessment domination is negatively associated with student's problem-solving ability as predicted, but our estimate is only slightly significant. Student participation in maths, as judged by teachers, is positively associated with the problem-solving score, but again, only weakly. Appendix 3 shows the regression estimates for the all the variables included in the regression.

7. Discussion and conclusion

This working paper has drawn on Young Lives 2016-17 school survey data to examine gendered differences in learning outcomes and learning motivation among students in Grade 10 in Vietnam. Specifically, the paper aimed to answer the following questions:

1. Are there differences in learning outcomes between Grade 10 boys and girls?
2. Are there differences in learning motivations between Grade 10 boys and girls?
3. Are differences in learning motivation related to learning outcomes?
4. What determines the differences in learning motivation and outcomes among boys and girls?

We found that female students in the study performed better than their male counterparts on the maths and English tests when we analyse their average scores on the cognitive test, with these differences being statistically significant. However, when we employed a multiple regression analysis, the results for maths changed. Using a value-added regression analysis to examine the determinants of achievement in maths and English and controlling for students' backgrounds and other factors that affect learning, the gender variable in the maths regression becomes positive in favour of boys. However, this estimate was not statistically significant. The gendered difference in the English test, however, remained positive and statistically significant in favour of girls. Girls outperformed boys in the English language test

and the result remained robust when other controls (including student prior score) were included. We also found self-concept in maths and English to have a positive and statistically significant effect on student performance. Without including other controls in our analysis, female students on average had higher scores on the maths test, but male students scored higher on average on the self-concept scale. This could be one of the reasons that, when we control for other factors including self-concept in maths, the variable on gender reverses in favour of males, although it is not statistically significant.

We also note that ethnicity (Kinh versus non-Kinh) had an impact on the maths score but not English. However, there is an interaction between ethnicity and gender. Not all children enrol in secondary school and non-enrolment is likely to be highest among non-Kinh females.

Our findings also revealed that assessment dominance is negatively associated with student achievement on the cognitive tests. Students who were interested in excelling in assessment more than learning because of an interest in the subject, performed less well than their counterparts who are more interest driven. Male students were more dominated by assessment than their female counterparts. Also, female students scored higher on the problem-solving tests administered in the school survey.

Our data suggest that female students in our sample have a higher motivation to learn and are showing higher achievement in their studies; this could perhaps be linked to their higher inclinations to pursue further studies than their male counterparts (Zharkevich et al. 2016). Indeed, recent Young Lives analysis of household data suggests that 19-year-old females are more likely to be continuing to pursue their studies than 19-year-old males (Zharkevich et al. 2016). But does this apparent advantage in education translate into equal opportunities in the labour market? ILO suggests that although male and female labour force participation rates are similar, female access to ‘decent work’ is more limited. Women earn less income than men on average, are more likely to be unemployed or underemployed, are principally found in vulnerable employment, and are more likely to be unpaid family workers or engage in invisible employment as migrant domestic workers, homeworkers, street vendors and in the entertainment industry (ILO n.d.). That female advantage in education, where it exists, does not translate into an advantage or equality in labour markets is becoming increasingly apparent. In Sri Lanka, for example, where gender equality in educational participation has long been the norm and females enjoy an advantage in cognitive skills in several areas, labour force participation is much lower, especially among married women with young children (Chowdhury 2013). Women demonstrate the same levels of non-cognitive skills in those skills valued by the labour market (e.g. agreeableness, decision-making and risk-taking) yet employers appear to treat these same skills differently when displayed by men and women (Gunawardene 2015).

The inclusion of a scale of assessment domination was novel – and suggested that boys are more likely than girls to report that they are motivated to learn by assessments and examinations than by an interest in the subject itself. This should be a concern for educators not only because a motivation dominated by assessment appears to relate to achievement negatively, but also because learning assessments are becoming more and more frequent in education systems everywhere. Learning to pass an endless range of tests may come to undermine learning stimulated by an enjoyment of learning, which in turn may translate into an over-concern with the external incentives offered by work at the expense of the performance of the job itself.

Where gender equity in education is the goal, we expect girls and boys to be performing equally well under the same conditions. At the same time, we would wish to raise levels of learning among all students over time. While in many systems it is girls' lower performance relative to boys that is of great concern, in Vietnam the picture is different. OECD's *ABC of Gender Equality in Education* (2015) raises the twin issues of boys' greater propensity to fail to attain baseline proficiency in maths, science and problem-solving, and high-achieving girls' greater propensity to underachieve in these subjects compared with high-performing boys. While our analyses of Young Lives data do not replicate those of the OECD, they do suggest that in Vietnam at least the picture is more complex. The mean performance of girls in our study was higher than that of boys in maths, English and problem-solving – but in maths this advantage reversed in favour of boys once a range of control factors were taken into account. To our knowledge this form of regression analysis has not been explored in the same way in the PISA studies to date. Our findings on lower self-concept in maths among girls resonate with those of the OECD on self-confidence.

Finally, if we seek to promote gender equity in the classroom we need to pay attention to the motivations and learning outcomes of girls *and* boys, and ways of increasing performance among girls and boys. Based on our analysis gender equity in academic performance requires attention to at least four areas: how to raise girls' self-concepts in maths; how to increase interest-oriented learning and reduce assessment-oriented learning; how to raise boys' motivations for learning in general; and, through them, how to increase boys' performance in English language and problem-solving. Further research can also provide deeper insights into the role socialisation plays in inequality of opportunities for boys and girls in Vietnam.

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Appendices

Appendix 1. Pairwise correlations among psychosocial scales and cognitive tests

	FO	LAC	EFT	PD	SCM	SCE	ADM	ADE
LAC	-0.22							
EFT	0.48	-0.48						
PD	0.53	-0.30	0.62					
SCM	0.20	-0.44	0.37	0.25				
SCE	0.11	-0.27	0.25	0.15	0.20			
ADM	-0.19	0.39	-0.39	-0.29	-0.49	-0.11		
ADE	-0.14	0.27	-0.29	-0.20	-0.10	-0.56	0.42	
Eng1	0.04	-0.02*	0.04	-0.02*	0.10	0.21	-0.03	-0.15
Eng2	0.04	-0.04	0.07	-0.01*	0.11	0.22	-0.06	-0.18
Math1	0.02*	-0.06	0.04	-0.01*	**0.21**	0.07	**-0.13**	-0.06
Math2	0.05	-0.06	0.06	-0.01*	**0.23**	0.07	**-0.16**	-0.07

Notes: *pairwise correlations not significant at p<0.01.

Appendix 2. Student characteristics and performance in maths and English

Variables	English (No lag test score)	English (lag test score)	Maths (No lag test score)	Maths (lag test score)
English score (W1)		0.336***		
		(0.0128)		
Gender (male)	-9.779***	-7.213***	7.020***	1.314
	(1.722)	(1.627)	(1.725)	(1.592)
Self-concept (English)	0.107***	0.0682***		
	(0.00943)	(0.00901)		
Assessment domination (English)	-0.0232**	-0.0195**		
	(0.00945)	(0.00891)		
Literate mother (Vietnamese)	2.939	2.306	5.678	3.325
	(4.436)	(4.184)	(4.488)	(4.118)
Literate father (Vietnamese)	-8.098*	-8.106**	0.326	-1.112
	(4.306)	(4.061)	(4.427)	(4.062)
Age	-0.297	-0.237	-0.963	0.927
	(1.661)	(1.566)	(1.656)	(1.520)
Days absent	-0.495	-0.581	-1.702	-1.449
	(1.217)	(1.148)	(1.157)	(1.061)
Wealth index	1.192*	0.518	0.216	-0.228
	(0.675)	(0.637)	(0.680)	(0.624)
Hours spent on homework (English)	3.456***	3.446***		
	(1.145)	(1.080)		
Teacher score for student home support	1.564**	1.040*	1.949***	1.253**
	(0.611)	(0.577)	(0.618)	(0.567)
Teacher score for student class participation (English)	1.721***	0.797*		
	(0.473)	(0.448)		
Expected education level	1.277***	0.471	2.467***	1.059**
	(0.484)	(0.457)	(0.490)	(0.452)
Ethnic	4.951	2.057	11.46**	6.732
	(5.248)	(4.951)	(5.154)	(4.730)
Lives at home	4.279	0.165	2.985	1.067
	(3.401)	(3.212)	(3.416)	(3.134)
Attends extra tuition to excel	1.234	0.708	5.766**	5.154**
	(2.479)	(2.339)	(2.513)	(2.306)
Attends extra tuition to keep up	-4.767**	-3.861*	-1.825	-0.823
	(2.270)	(2.141)	(2.300)	(2.111)
Self-concept (maths)			0.140***	0.0860***
			(0.00943)	(0.00881)
Assessment domination (maths)			-0.00675	-0.00952
			(0.00929)	(0.00852)
Hours spent on homework (maths)			0.0159	0.645
			(1.264)	(1.160)
Teacher score for student class participation (maths)			1.358***	0.884**
			(0.461)	(0.423)
Maths score (W1)				0.406***
				(0.0124)
Constant	441.5***	304.9***	400.5***	218.1***
	(28.09)	(27.00)	(27.83)	(26.13)
Observations	5,778	5,778	5,937	5,937
R-squared: Within	0.073	0.176	0.078	0.224
Between	0.4890	0.815	0.432	0.835
Overall	0.1495	0.5139	0.165	0.556
Number of class	210	210	220	220

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 3. Student characteristics and performance on the problem-solving test

Variables	(1) No W1 maths test	(2) Includes W1 maths test
Score on W1 maths test		26.59***
		(1.747)
Self-concept in English	-1.742	-1.857
	(1.295)	(1.275)
Personal development	1.611	2.380
	(1.595)	(1.573)
Effort	-1.223	-0.242
	(1.686)	(1.663)
Boy	-16.15***	-18.78***
	(2.380)	(2.348)
Age	-1.307	0.0502
	(2.279)	(2.249)
Number of days absent	-4.321***	-3.742**
	(1.589)	(1.563)
Hours spent on maths homework	-0.107	0.142
	(1.743)	(1.717)
Teacher score for student home support	2.435***	1.677**
	(0.780)	(0.755)
Teacher score for student class participation (maths)	1.793***	1.162*
	(0.618)	(0.608)
Self-concept in maths	9.557***	5.623***
	(1.498)	(1.497)
Assessment domination maths	-3.086*	-2.775*
	(1.580)	(1.557)
Attends tuition to excel	-4.235	-5.585*
	(3.405)	(3.348)
Attends tuition to keep up	-10.22***	-10.39***
	(3.122)	(3.068)
Higher expectations for education	0.843	-0.370
	(0.667)	(0.661)
Literate mother (Vietnamese)	10.72*	7.998
	(6.124)	(6.034)
Literate father (Vietnamese)	-8.568	-9.779
	(6.083)	(5.994)
Wealth	-0.0818	-0.759
	(0.926)	(0.912)
Ethnic majority (Kinh)	11.86*	5.053
	(6.405)	(6.225)
Lives at home	11.91**	9.524**
	(4.628)	(4.551)
Constant	474.5***	481.7***
	(36.59)	(36.00)
Observations	5,894	5,894
Number of classunique	220	220

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix 4. Summary statistics for variables used in the analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
Lag English score (W1)	8,740	500.00	100.00	240.31	766.02
Lag maths score (W1)	8,740	500.00	100.00	222.04	793.27
Gender (male)	8,425	0.50	0.50	0.00	1.00
Self-concept in English	8,740	0.00	0.88	-3.04	2.90
Assessment domination in English	8,740	0.00	0.85	-2.27	2.85
Self-Concept (maths)	8,740	0.00	0.89	-3.22	2.80
Assessment domination (maths)	8,740	0.00	0.88	-3.04	2.90
Literate mother (Vietnamese)	8,395	0.91	0.29	0.00	2.00
Literate father (Vietnamese)	8,382	0.94	0.23	0.00	2.00
Age	8,378	15.32	0.53	14.00	24.00
Days absent	8,740	0.31	1.02	0.00	20.00
Wealth index	8,740	-0.01	2.31	-8.29	3.09
Hours spent on homework (English)	7,627	1.78	0.80	0.00	3.00
Teacher score for student home support	7,762	6.53	1.97	0.00	10.00
Teacher score for student class participation (English)	7,494	5.87	2.12	0.00	10.00
Expected education level	7,248	5.38	1.98	1.00	8.00
Ethnic group (Kinh)	8,413	0.88	0.33	0.00	1.00
Student lives at home	8,361	0.87	0.34	0.00	1.00
Attends extra tuition to excel	8,740	0.14	0.35	0.00	1.00
Attends extra tuition to keep up	8,740	0.17	0.37	0.00	1.00
Hours spent on homework (maths)	7,822	1.96	0.70	0.00	3.00
Teacher score for student class participation (maths)	7,674	6.01	2.08	0.00	10.00

Appendix 5. Mean gendered differences in student characteristics

Variables	Female	Male	Significance of difference
Age	15.28	15.35	***
Days absent	0.20	0.31	***
Wealth index	0.26	0.34	**
Hours spent on homework (maths)	2.03	1.88	***
Hours spent on homework (English)	1.88	1.67	***
Teacher score for student home support	6.66	6.41	***
Teacher score for student class participation (maths)	6.08	5.97	**
Teacher score for student class participation (English)	6.10	5.63	***
Expected education level	5.56	5.20	***
Ethnic group (Kinh)	0.90	0.85	***
Student lives at home	0.88	0.85	***
Attends extra tuition to excel	0.16	0.13	***
Attends extra tuition to keep up	0.19	0.16	***

Note: *** p<0.01, ** p<0.05, * p<0.1.

Appendix 6. List of psychosocial scales administered in the Vietnam school survey

Future orientation
1. I study to increase my job opportunities for a good type of work in the future
2. I am working hard in school to ensure that my future will be financially secure
3. Making an effort in my studies is worth it because it will help me in the work I want to do later on
4. I want to learn as much as I can in school to help me get good work in the future
5. I want to learn as much as I can in school to help me go on to college/university
6. I am working hard in school to help me gain admission to higher studies
7. Making an effort in my studies now is worthwhile because it will help me in my studies later on
8. Learning well in school will improve my work prospects and chances in the future
9. I am working hard in school to be able to get work in the future and support my family in the future
10. I want to do well at school to help my brothers and sisters in the future
11. Success in examinations will determine how successful I am in later life
12. Since success in the future is uncertain there is little use in learning very much

Low academic self-confidence
1. I day dream a lot in class
2. Most of my classmates are smarter than I am
3. My teachers feel that I am poor in my work
4. I often forget what I have learnt
5. I get frightened when I am asked a question by the teacher
6. I often feel like quitting school
7. I am always waiting for the lessons to end
8. I always do poorly in tests
9. I am not willing to put in more effort in my school work

Effort
1. I pay attention to the teacher during lessons
2. I am willing to do my best in class
3. I study hard for my tests
4. If I put in enough effort I can succeed
5. When studying I work as hard as possible
6. When studying I keep working even if the material is difficult
7. When studying I try to do my best to acquire the knowledge and skills taught
8. Setbacks in learning do not discourage me
9. I am a hard worker
10. I am diligent
11. I am conscientious
12. I want to do as little work as possible
13. I want to do well but only if the work is easy
14. If exercises are difficult I just don't do them
15. I choose easy options so that I don't have to work too hard

Personal development
1. Studying gives me a lot of personal satisfaction
2. I like studying because most of my subjects are really interesting
3. I spend a lot of time working on topics I am interested in
4. Keeping up with my studies helps to develop my character
5. Learning is an important personal experience
6. Learning in school teaches me to become self-disciplined
7. I want to do well in school to show myself that I can learn new things
8. I want to do well in my studies to show myself that I can learn difficult school work
9. I work hard at school because I am interested in what I am learning
10. Learning in school develops me as a person

Positive self-concept (maths)
1. I get good marks in maths
2. Maths is one of my best subjects
3. I have always done well in maths
4. I learn things quickly in maths
5. I'm hopeless in maths
6. Maths is one of my worst subjects
7. I have never done well in maths
8. I get poor marks in maths

Positive self-concept (English)
1. I get good marks in English
2. English is one of my best subjects
3. I have always done well in English
4. I learn things quickly in English
5. I'm hopeless in English
6. English is one of my worst subjects
7. I have never done well in English
8. I get poor marks in English

Assessment domination (maths)
1. It is important that I enjoy doing maths even if I do not do well in the examinations
2. I study maths just to pass the examination
3. In maths I study only those topics prescribed in the examination syllabus
4. I study in order to do well in the exam rather than to develop my interest in the subject
5. I spend a lot of time working on maths topics I am interested in even if they are not important for my examinations

Assessment domination (English)
1. It is important that I enjoy doing English even if I do not do well in the examinations
2. I study English just to pass the examination
3. In English I study only those topics prescribed in the examination syllabus
4. I study in order to do well in the exam rather than to develop my interest in the subject
5. I spend a lot of time working on English topics I am interested in even if they are not important for my examinations

Appendix 7. Psychosocial skills scales test for `internal reliability' using Cronbach's alpha

Scale	Alpha-scale reliability
Future orientation (FO)	0.84
Low academic self-confidence (LAC)	0.79
Effort (EFT)	0.84
Personal development (PD)	0.83
Self-concept of maths (SCM)	0.86
Self-concept of English (SCE)	0.86
Assessment domination maths (ADM)	0.72
Assessment domination English (ADE)	0.80

Learning Motivations, Learning Outcomes and Gender in Vietnam

This working paper uses the 2016-17 Young Lives school survey data in Vietnam to examine learning outcomes and learning motivations for boys and girls in Grade 10. It examines how differences in learning motivations impact on learning outcomes and future expectations, and also examines the determinants of these differences and their relationships with student's background and prior learning attainment.

The findings reveal that girls are approaching their studies with more discipline and diligence than boys on average. In general, girls demonstrate more of the favourable traits and attitudes to learning. The findings also indicate that, on average, girls are doing better in both maths and English and making better progress. However, their superior performance in mathematics isn't robust enough to remain in their favour in more sophisticated analysis. Even though girls are on average doing better in maths, their beliefs about their maths abilities are low. Boys tend to have higher confidence in their maths abilities. The paper highlights four areas requiring attention in research and policy discussions on gender equity in Vietnam: how to raise girls' self-concepts in maths; how to increase interest-oriented learning and reduce assessment-oriented learning; how to raise boys' motivations for learning in general; and, through them, how to increase boys' performance in English language and problem-solving.

Young Lives

An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in four countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the four study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Pankhurst Development Research and Consulting plc, Ethiopia*
- *Centre for Economic and Social Studies, Hyderabad, India*
- *Save the Children India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarollo (GRADE), Peru*
- *Instituto de Investigación Nutricional, Peru*
- *Centre for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
- *General Statistics Office, Vietnam*
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