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On the interpretation of non-cognitive skills: Implications for the South African economics of education

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*Abstract:*

The South African economics of education has so far been largely silent on the role of non-cognitive skills in the learning process. This contrasts noticeably with an international literature that recognises non-cognitive skills as both an important input and outcome of education. Drawing on evidence from the international literature, this paper makes the case that the South African economics of education should build on the existing international knowledge base of the role of non-cognitive skills in the learning process. This will require cross-disciplinary collaboration as we seek to incorporate these skills into research and practice aimed at improving learning outcomes in the country.

## 1. Introduction

One of the main goals of research in the economics of education is to understand how learning outcomes are produced (Garcia, 2013). While this question is accorded a high priority in most countries, the underperformance of South Africa's schooling system, and the massive learning losses caused by the COVID-19 pandemic, make it all the more urgent that the determinants of academic (under-) performance are identified and addressed. Local efforts aimed at answering this central question in education research have centred around the role of classroom, school, and broader institutional factors in producing the country's poor learning outcomes. This evidence has enabled us to understand the role of schools in determining learning outcomes in the country, however local research has largely remained silent on the role of affective factors and their association with learning outcomes. One of the major insights from the international literature is that non-cognitive skills are crucially important for supporting learning (Heckman, 2006; Garcia, 2014; Kautz *et al.*, 2014; Khine, 2016; Humphries and Kosse, 2017). As a result, non-cognitive skills have become an important area of study in the economics of education internationally.

The extant literature on the role of non-cognitive skills in education is dominated by evidence from high-income countries (HICs). As a result, we know little about how non-cognitive skills are related to learning in resource-deprived contexts that characterise much of the developing world, including South Africa. This paper reviews the existing literature on the role of non-cognitive skills in education, with the view to illustrating how including these skills in South Africa's economics of education research agenda could improve our understanding of how learning outcomes are produced.

## 2. Background and motivation

“The multiple nature of skills is often ignored in many public policy discussions. For example, policy discussions surrounding education and the output of schools often focus on measuring, enhancing, and rewarding cognitive ability measured using achievement tests... An important lesson from the recent economics of human development is that cognitive

skills are only part of what is required for success in life. Personality skills - that is, 'soft skills', such as trust, altruism, reciprocity, perseverance, attention, motivation, self-confidence, and personal health - are also important. Health and mental health are essential skills; so too are the abilities to make wise decisions, to guide one's life by reflective reason, and to plan ahead. These skills are often neglected in scientific analyses and policy discussions alike" (Heckman and Corbin, 2016: 345).

This perspective of Heckman and Corbin (2016) reflects a growing consensus in economics, namely that non-cognitive skills are crucial determinants of meaningful life outcomes, including educational attainment, labour market success, health, and non-criminality – to name a few. The evidence from this body of work – termed the 'skill formation literature' or the 'economics of human development' – has strongly influenced the economics of education, where non-cognitive skills are increasingly regarded as both crucial inputs and outcomes of the schooling process. Consequently, non-cognitive skills have become central to education policy internationally, with development organisations and national education departments formally placing non-cognitive skills on their agendas (see for example Garcia (2014); OECD (2015); and Puerta and Valerio (2016)).

Despite this surge of interest in non-cognitive skills among education researchers and policymakers alike, there is a dearth of evidence of the association between non-cognitive skills and learning outcomes from low- and middle-income countries (LMICs). An important unanswered question in the international literature, therefore, is whether the strong association between these skills and educational outcomes observed in HICs holds in contexts of severe resource deprivation that characterise much of the developing world. Evidence from the United States (US) suggests that non-cognitive skills, such as perseverance, positive attitudes toward school, and student engagement are strongly associated with academic success. But does it help to be perseverant in a school that does not have basic instructional materials? Is there any benefit to having a positive attitude toward mathematics when one's teacher lacks the content knowledge and pedagogical skill to effectively teach the curriculum? How is student engagement related to learning outcomes when there is limited instructional time and opportunity to learn in the school day?

These questions speak to Pritchett and Sandefur's (2013: 33) argument – which reflects an emerging perspective among other prominent development economists (see for example Ravallion (2020) and Hanushek (2021)) – for the importance of evaluating associations that are well-established in HICs in a broader range of contexts, particularly LMICs:

"Inasmuch as development economics is a worthwhile, independent field of study – rather than purely a parasitic form of regional studies, applying the lessons of rich-country economics to poorer settings – its central conceit is that development is different. The economic, social, and institutional systems of poor countries operate differently in rich countries in ways that are sufficiently fundamental to require different models and different data."

Evaluating the association between non-cognitive skills and learning outcomes in a developing country context such as South Africa is therefore required for understanding whether the associations observed in HICs hold in our context. But the motivation behind including these skills in South Africa’s education research agenda extends beyond simply evaluating associations observed in HICs in the South African context. There are many unanswered questions in the international literature on non-cognitive skills that South African economists of education are particularly well-placed to address. For example, while all countries exhibit an achievement gap between rich and poor students, South Africa’s achievement gap is one of the largest in the world. Evidence from South Africa could ideally be used to investigate how potential differences in non-cognitive skills by socio-economic status (SES) contribute to the achievement gap. Similarly, while a number of authors have hypothesised that the institutional features of schools may be important in the formation of non-cognitive skills (such as Brunello and Schlotter (2011)), there is very little empirical evidence of this hypothesised relationship. Again, evidence from South Africa, where schools differ markedly in terms of their institutional arrangements, could contribute greatly to the international knowledge base in this regard.

### 3. A brief history of the study of the role of non-cognitive skills in the economics of education

Researchers wishing to understand the role of non-cognitive skills in education are faced with a number of challenges that perhaps explain why these constructs have not received much attention in South African education research. This section traces the history of the study of non-cognitive skills in an attempt to provide insight into the origins of the term, the different types of constructs that are included under the umbrella of “non-cognitive skills”, and how these skills are related to learning outcomes in the literature from HICs.

The idea that non-cognitive skills are important determinants of educational outcomes is, of course, not new. More than a century ago, psychologists Binet and Simon (1916: 254) noted that performance in school “admits other things than intelligence; to succeed in his studies, one must have qualities which depend on attention, will, and character.” Despite this important caveat to the work of the architects of the first modern IQ test (Almlund *et al.*, 2011), economists of education would go on to focus on the development of cognitive skills as both a determinant and objective of formal schooling. A telling example of this is how Coleman’s (1966) models of achievement in his *Equality of Educational Opportunity* report – which is widely considered to mark the inception of the economics of education as a discipline (Hanushek, 1979) – included non-cognitive skills as covariates yet disregarded the related coefficients. Coleman found that internal locus of control had a stronger relationship with achievement than did all the school factors included in his model together. That this result was deliberately de-emphasised, both

by Coleman and those who engaged with his work, illustrates just how little interest there was in non-cognitive skills within education research and policy at the time<sup>1</sup>.

A decade after the Coleman report, economists Bowles and Gintis (1976) emphasised the role of non-cognitive skills in education, stressing non-cognitive traits over IQ in the inheritance of social class (Sampson, 2016). Bowles and Gintis were also the first to explicitly contrast non-cognitive skills with cognitive skills in determining educational outcomes (Farkas, 2011). Interestingly, the work of Bowles and Gintis did not immediately spur further interest among economists in the relationship between non-cognitive skills and educational outcomes. Instead, this research agenda was taken up by sociologists of education (beginning with the work of Jencks, Crouse and Mueser (1979)), who were especially concerned with expanding Bowles and Gintis' work on the links between non-cognitive skills, education, and social mobility. Education economists chose to focus on the relationship between school characteristics and achievement, maintaining that these factors are the most amenable to policy intervention (Hanushek, 1979). This perspective would persist in the economics of education for the next thirty years.

As the findings from labour economics (pioneered by Heckman and colleagues (2000, 2006)) increasingly pointed to the importance of non-cognitive skills in determining meaningful life outcomes, however, education economists have re-visited these skills as potentially important inputs into the production of education. This shift is clearly illustrated in the fact that the first chapter of the fourth volume of the *Handbook of the Economics of Education* (Hanushek, Machin and Woessmann (eds), 2011) is titled *Personality Psychology and Economics* (Almlund *et al.*, 2011) and chronicles the history of the study of non-cognitive traits in economics research. These authors also document the substantial body of evidence of the strong link between non-cognitive skills and educational outcomes. Contributions to the literature on the role of non-cognitive skills in producing learning outcomes during the last decade have mainly comprised methodological contributions in the form of proposed statistical techniques for addressing problems of measurement error and reverse causality that plague earlier studies (see for example Heckman and Corbin (2016)). Attempts have also been made at evaluating the association between non-cognitive skills and achievement in experimental settings (see Durlak *et al.* (2011) for a summary of this evidence). The most recent contributions to the literature on non-cognitive skills in the production of education have included attempts to formally unify the skill formation and educational production function research paradigms by developing complex econometric techniques for simultaneously estimating the effects of home and school environments on the production of cognitive and non-cognitive skills (Agostinelli, Saharkhiz and Wiswall, 2019).

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<sup>1</sup> While the authors of the first studies in the economics of education acknowledged the importance of non-cognitive skills in determining learning outcomes, very little was known about the formation of non-cognitive skills at the time (including whether they could be fostered through intervention), and therefore these results were not considered relevant for policy purposes (see Hanushek (1968)).

Four conclusions emerge from this evidence from HICs. Firstly, non-cognitive skills (in particular, the Big Five personality traits of conscientiousness and openness to experience) strongly predict both years of schooling completed (Almlund *et al.*, 2011) and test scores (Poropat, 2009). Secondly, in studies where intelligence is controlled for, the evidence is suggestive of a correlation between conscientiousness and academic performance that is largely independent of intelligence (Poropat, 2009; Rosander, Bäckström and Stenberg, 2011). Thirdly, in terms of the origins of non-cognitive skills, the existing evidence from HICs strongly suggests that many of these skills are formed in early childhood, and as such, that home background has a strong influence on the formation of these skills (Heckman, 2008; Agostinelli, Saharkhiz and Wiswall, 2019). Lastly, there is strong evidence that non-cognitive skills can be fostered through targeted interventions. Perhaps the most widely-cited evidence in this regard are findings from the Perry Preschool Programme in the US, an early childhood intervention which aimed to boost the non-cognitive skills of disadvantaged children. The results from the intervention showed that although the intervention did not boost IQ, participants had higher test scores than children in the control group at age 10, a result which Heckman (2011) attributes to the impact of the programme on participants' non-cognitive skills. Similar positive results of interventions that target non-cognitive skills have been reported in other studies: In their meta-analysis of 213 randomised control trials that targeted non-cognitive skills, Durlak *et al.* (2011) find that social and emotional learning interventions significantly improved the non-cognitive skills, behaviour, and academic performance of participants compared to controls.

#### 4. What are non-cognitive skills?

The literature has not settled on a stable definition of the term “non-cognitive skills”. Consequently, the particular skills studied varies by the particular discipline within which studies of these constructs are located. Psychologists often conceive of non-cognitive skills as the Big Five personality traits, namely openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Bjorklund-Young, 2016)<sup>2</sup>. The non-cognitive skills studied by economists in the literature described in the preceding section vary widely and include affective factors such as internal locus of control (Coleman *et al.*, 1966), self-efficacy beliefs (Hanushek, 1968), educational aspirations (Beattie, Laliberté and Oreopoulos, 2016), interpersonal skills (Agostinelli, Saharkhiz and Wiswall, 2019), conscientiousness, and growth mindset (West *et al.*, 2016), as well as realised behaviours such as procrastination (Beattie, Laliberté and Oreopoulos, 2016).

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<sup>2</sup> Although these traits were originally considered as stable across the life cycle, evidence from the skill formation literature (see for example Cunha and Heckman (2007)) shows that these traits are produced as the result of genetic as well as environmental influences, with the important implication that they can be fostered through targeted intervention. According to Cunha and Heckman (2007), the latter criteria qualify them for study in education research.

## 5. How are non-cognitive skills measured?

Non-cognitive skills are notoriously difficult to measure, particularly among children (Duckworth and Yeager, 2015). As a result, researchers have not settled on the best way to measure these skills (especially for educational purposes). The most common approach to measuring non-cognitive skills is through self-report likert scales, whereby respondents are asked to rate themselves on a number of statements whose responses are added up to provide an overall scale score. An example of this type of scale is the Short Grit Scale (Grit-S) (Duckworth and Quinn, 2009), which consists of eight statements such as “I finish whatever I start” and require respondents to rate the statements on a five-point scale, from “Not at all like me” to “Very much like me”. The advantages of this approach are that self-report likert scales are relatively easy to develop, simple to administer, straightforward to score, and typically succinct (Petway, Brenneman and Kyllonen, 2016). However, since these scales are transparent, they are susceptible to socially desirable responding – that is, false reporting where respondents try to paint themselves in a favourable light. Self-report forced-choice scales are often used to attempt to overcome this limitation of simple self-report likert scales, where respondents are asked to choose between multiple competing statements that appear to be equally desirable. While these scales have been shown to be less susceptible to acquiescence bias (Petway, Brenneman and Kyllonen, 2016), they may be difficult or frustrating for survey respondents to answer, especially younger respondents who are not used to making such judgements. Other-report scales (by respondents who know children well, such as their parents or teachers) are also used to measure non-cognitive skills, and there is evidence to suggest that they may provide better judgements of children’s attitudes, beliefs, and behaviours than self-reports (Petway, Brenneman and Kyllonen, 2016). Lastly, performance tasks can also be used to assess non-cognitive skills. This approach is especially attractive for assessing school-age children, since they are often interactive, which makes them more enjoyable, and they are less reliant on verbal skills than self-reports (Petway, Brenneman and Kyllonen, 2016). These measures often require trained administrators, however, which challenges the feasibility of making use of them at scale.

## 6. Non-cognitive skills and education in LMICs

The evidence of the strong association between non-cognitive skills and meaningful life outcomes from HICs has sparked interest in these skills among the international development community. As Scorza *et al.* (2017: 1) argue:

“Human development and economic development are intrinsically linked. Guided by human capital theory, economists are increasingly recognising the importance of a range of other skills - in addition to intelligence and technical skills – for economic success. Until fairly recently, years of education completed, literacy, numeracy, and IQ – often used as proxies for cognitive ability – were the main measures to assess the relationship between human capital and economic development. More recently, researchers and practitioners have acknowledged that skills such as the ability to work in groups, maintain good interpersonal relations and a positive attitude, control impulses and demonstrate goal-oriented behaviour are all critical to economic productivity and individual success.”

Education researchers, in particular, are increasingly looking to interventions that target non-cognitive skills as having the potential to unlock learning in resource-limited countries. The evidence base for the role of non-cognitive skills in education in LMICs is extremely thin, however, with researchers only very recently beginning to address this gap in the literature. A major source of data on non-cognitive skills for LMICs is Young Lives, which captures information about children's attitudes, feelings, perceptions, and aspirations, as well as test scores, which makes it possible to link these non-cognitive constructs with academic performance. To date, Young Lives has collected data on more than 12,000 children in Ethiopia, India, Vietnam, and Peru, which has been used to study the association between non-cognitive skills and academic achievement in all four countries (see for example Dercon and Singh (2013); Singh and Sarkar (2015); Favara (2017); and Abera (2018)). In an evaluation of an intervention that targeted displaced Nigerian children's non-cognitive skills, Kim, Brown and Weiss-Yagoda, (2018) find that the programme positively impacted children's non-cognitive skills and reading and mathematics achievement. This evidence is suggestive that targeting children's non-cognitive skills can improve academic achievement, even among at-risk populations who have limited access to resources. Miranda and Domingues (2018) evaluate the association among the Big Five personality traits and academic achievement among Brazilian students in grades 5, 8, and 10, and find that both conscientiousness and 'openness to experience' significantly predicted reading and mathematics scores. Lastly, He *et al.* (2021) examine the association between the non-cognitive skill of grit and mathematics achievement (while controlling for IQ) among a sample of children in rural China, and find that both IQ and grit significantly predict the mathematics scores of the average student. Interestingly, this association does not hold among low-IQ students, suggesting that grit does not translate into academic achievement gains for students with delays in general cognitive ability. This could indicate that there is threshold a threshold of cognitive skills that must be reached before non-cognitive skills can augment the learning process.

To the best of the author's knowledge, there are only five published studies that examine the association between non-cognitive skills and student achievement in South Africa. Four out of the five studies investigate the association between the non-cognitive skill of grit and academic achievement. The studies of Mason (2018) and Pleace and Nicholls (2021) both examine this association among university students and find that grit significantly predicts university grades. Wills and Hofmeyr (2019) and Hofmeyr (2021) investigate this association among grade 6 learners in township and rural schools across three provinces in South Africa, and find that grit significantly predicts the probability of being a positive outlier in reading achievement (Wills and Hofmeyr, 2019) and reading achievement in general (Hofmeyr, 2021). Importantly, Hofmeyr's (2021) analysis points to evidence of moderating effects between grit and school functionality in predicting reading achievement, with higher returns to grit estimated for students in more functional schools. The latter study is the first to consider potential interaction effects between school quality and non-cognitive skills in producing learning outcomes, and



illustrates how data from South Africa can be used to address important unanswered questions in the international literature on the role of non-cognitive skills in producing learning outcomes, especially in LMICs. Hofmeyr (forthcoming) also investigates the potential role of gender differences in student attitudes toward reading in explaining South Africa's large pro-girl gap in grade 4 reading achievement, and finds that girls have much more positive attitudes toward reading than boys, and that this explains part of their advantage in early-grade reading achievement. The latter result illustrates how including non-cognitive skills in models of student achievement can improve our understanding of the reasons for some well-established features of the South African schooling system, such as the country's large pro-girl gap in reading achievement.

## 7. Limitations of existing research on non-cognitive skills

It is clear from this evidence that non-cognitive skills are highly predictive of learning outcomes, and that this association seems to exist even in resource-limited contexts. Unfortunately, this evidence is subject to a number of important limitations that will need to be addressed in researchers' efforts to include non-cognitive skills in the South African economics of education's research agenda.

### 7.1. Lack of conceptual clarity around what non-cognitive skills represent

A major limitation of many studies that examine the relationship between non-cognitive skills and learning outcomes is that the choice of non-cognitive skills seems to be based on data availability, rather than solid theoretical underpinnings (Farrington *et al.*, 2012; Garcia, 2013; Scorza *et al.*, 2017). For example, the four South African studies cited above all study the construct of grit and its association with academic achievement, however there is no evidence that grit is either most pertinent to school performance or most malleable in school settings. In a meta-analysis of the grit literature, Credé (2018: 5) argues that this literature "is currently characterised by a number of serious theoretical and empirical challenges". He highlights the overlap between grit and the existing construct of conscientiousness, as well as the lack of evidence regarding the malleability of grit through targeted interventions, as particularly problematic.

These criticisms highlight the lack of conceptual clarity around many of the constructs that are included under the broad umbrella of "non-cognitive skills" in education research. This limitation is hardly surprising, given the generic definition of non-cognitive skills that is currently used in the literature. According to Heckman and Kautz (2012: 2), for example, non-cognitive skills include "personality traits, goals, motivations, and preferences". In this sense, the term non-cognitive skills is used as a catch-all term for everything that matters for achievement and is not captured by measures of 'cognitive' skills, such as IQ. Such a conceptualisation limits the applicability of studies of non-cognitive skills to education policy and practice. This limitation will have to be addressed in future research if we are to advance the science of non-cognitive skills in education.

## 7.2. Measurement challenges

A related limitation is the reliability with which non-cognitive skills are measured. Concerns around self-reported measures of non-cognitive skills are well-documented in the literature from HICs (Marsh *et al.*, 2013; Duckworth and Yeager, 2015; Halle and Darling-Churchill, 2016; Del Bono, Kinsler and Pavan, 2019). These concerns are even more pressing in contexts of low literacy, such as South Africa, and many other LMICs. Of particular concern among respondents with low literacy is what Marsh (1984) calls negative items bias, which he defines as occurring “when a child responds inappropriately by saying ‘true’ to a negative statement when his or her responses to positive items have consistently indicated that the opposite response would be more appropriate, or vice versa” (Marsh, 1984: 37). Weems, Onwuegbuzie and Collins (2009) argue that negatively worded items are particularly difficult for poor readers to answer, since negative ideas occupy twice as much space in working memory as positive ideas. This presents a bigger problem for poor readers, since individuals with low reading ability experience semantic processing problems that limit their ability to generate inferences while engaged in the reading process (Weems, Onwuegbuzie and Collins, 2009). O’Riordan (2021) presents evidence of such negative item bias from South African TIMSS<sup>3</sup> data: Based on grade 8 students’ responses to student questionnaire items aimed at tapping mathematics enjoyment and self-efficacy beliefs, he finds that positively and negatively worded items differ in their ability to capture information of the same underlying construct, with negatively-worded items appearing to be noisy reflections of positively-worded items. Given these results, a number of authors concur that negatively worded statements add confusion that results in such items “measuring the students’ ability to read carefully rather than their objective-based skills” (Carey, 2001: 126).

In light of these concerns, it is imperative that response patterns to questionnaire items aimed at tapping non-cognitive skills are evaluated (and reported on) in studies that investigate the associations between these skills and learning outcomes. It is especially important that researchers check for systematic differences in responses to negatively versus positively worded items. One way of dealing with these differences, if they exist, is to construct a variable that measures the difference between the negatively worded and positively worded items that comprise a given non-cognitive construct. More literate students would have a smaller gap between scores on the negatively versus positively worded items, thus this variable could approximate literacy ability. Controlling for this variable in regressions of student performance could therefore allow one to correct for negative item bias. If researchers are involved in the survey design process, it would be even better if negatively worded items are avoided altogether, especially if the surveys are conducted in contexts of low literacy. Negatively worded items are typically included in questionnaires to guard against acquiescence bias, where respondents tend to agree with statements without regard for their actual content (Salazar, 2015). However, there is growing consensus

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<sup>3</sup> Trends in Mathematics and Science Study.

in the psycholinguistics literature that attempting to correct for acquiescence bias by including negatively worded items introduces artefacts that may be more problematic for construct validity than acquiescence bias itself (Weems *et al.*, 2003; Weems, Onwuegbuzie and Lustig, 2009; Roszkowski and Soven, 2010; Salazar, 2015). As a result, a number of authors have recommended that negatively worded items be excluded from student surveys, especially when administered in contexts of low literacy (Abu-Hilal *et al.*, 2013; Salazar, 2015). At the very least, the evidence from this scholarship shows that the wording of questionnaire items is extremely important in determining the reliability with which non-cognitive skills are measured and, therefore, requires careful consideration.

### 7.3. Causality

Another major limitation of much of the literature on non-cognitive skills is that cross-sectional data is often used. This is especially the case for studies conducted in LMICs, and inevitably means these studies are subject to the same criticism that plagues all studies that rely on non-experimental data, namely that causation cannot be inferred from the associations observed. Studies that attempt to overcome this limitation usually employ early measures of non-cognitive skills to predict later outcomes (Almlund *et al.*, 2011). Indeed, using student-level panel data which includes measures of non-cognitive skills to estimate causal effects of non-cognitive skills on student achievement is a fast-growing area of research within the economics of education (see for example Cunha and Heckman (2007, 2008); Agostinelli (2018); Agostinelli, Saharkhiz and Wiswall (2019); Attanasio *et al.* (2020)). It is important to note, however, that the application of these techniques to contexts such as South Africa will not be possible as long as such panel data is not available. As a result, it is imperative that efforts are made to collect panel data on both cognitive and non-cognitive skills in South Africa. Only when such data becomes available will it be possible to attempt to infer causality in the relationship between non-cognitive skills and academic achievement for South African children.

## 8. Recommendations

The preceding discussion suggests that the role of non-cognitive skills in educational production in LMICs such as South Africa is a promising area for future research. This research should focus on addressing the limitations set out in the section above, especially if we intend to take seriously the possibility that improving students' non-cognitive skills may be a powerful but hitherto overlooked policy lever for raising learning outcomes in the country. This subsection summarises three recommendations for future research on the role of non-cognitive skills in educational production. This is done with a view to mapping a research agenda for the study of non-cognitive skills in the production of learning outcomes in South Africa, with the ultimate goal of informing policy aimed at improving learning outcomes.

### 8.1. Evidence from resource-deprived contexts

As discussed in Section 2, studying non-cognitive skills in the resource-deprived contexts that characterise much of South Africa's education landscape allows us to investigate important questions about the role of these skills in education that evidence from HICs is not able to address. Adding evidence from LMICs such as South Africa to the international evidence base may therefore help us improve existing theories of the role of non-cognitive skills in education. Studying these skills in South Africa has the potential to benefit not only local research and practice, but also the international research community's understanding of the role of non-cognitive skills in producing learning outcomes. There is ample evidence that, at least for the time being, education scholarship is committed to better understanding the role of non-cognitive skills in the learning process. The past decade of research in the economics of education, for example, has seen not only a surge in books and journal articles on non-cognitive skills, but also the establishment of working groups and entire research units at some of the top institutions in the field devoted to this topic. The establishment of the Centre for the Economics of Human Development at the University of Chicago in 2014 is a prime example of the centrality of the study of non-cognitive skills to the economics of education as a discipline<sup>4</sup>. The establishment of the Human Capital and Economic Opportunity (HCEO) Global Working Group in 2010 is another prime example. The working group consists of more than 500 researchers (including some of the top researchers in the economics of education, such as Hanushek and Heckman) and focusses on promoting interdisciplinary research with a view to improving our understanding of human capital development (including non-cognitive skills) and its impact on inequality (HCEO, n.d.). It is thus clear that the economics of education as a discipline is devoting significant funding and research effort to understanding the role of non-cognitive skills in predicting meaningful life outcomes. The preceding discussion in this paper suggests studying non-cognitive skills in an LMIC like South Africa may provide new insights that can advance this research agenda, even with relatively simple econometric techniques and limited data. As such, further studying non-cognitive skills in LMICs such as South Africa could be “low-hanging fruit” in the broader research project that economists of education are already devoting much funding and research effort to.

### 8.2. Aligning frameworks across disciplines

Osher *et al.* (2017) argue that gaining conceptual clarity around what non-cognitive skills represent will require, first and foremost, aligning the various different frameworks that are currently used to study the role of non-cognitive skills in education. They argue that the focus of this alignment should be creating a common and clear language of non-cognitive skills for practitioners. An example of efforts toward such alignment is the Collaborative for Academic, Social, and Emotional Learning's (CASEL) creation of the Establishing Practical Social-Emotional Competence Assessments Work Group. The

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<sup>4</sup> See the CEHD's website: <https://cehd.uchicago.edu>.

working group consists of over 60 researchers and practitioners and has released a number of synthesis reports that aim to create the alignment in research on non-cognitive skills in education that Osher *et al.* (2017) call for (see for example Berg *et al.* (2019) and McKown (2019)). Unfortunately, CASEL's working group focuses exclusively on the development of aligned frameworks for the study of non-cognitive skills for the North American context. The establishment of a similar working group for research on non-cognitive skills in South Africa and Sub-Saharan African contexts, specifically, is likely to promote alignment in this research at the outset.

### 8.3. Improving measurement

In addition to efforts aimed at better defining non-cognitive skills, the limitations related to the measurement of non-cognitive skills raised above points to the importance of devoting significant research efforts to developing better measures of these skills. Of particular importance is the need to develop instruments that can reliably measure non-cognitive skills in LMIC contexts such as South Africa. This is a small but growing area of research within the international development literature (see for example the work of Laajaj and Macours (2017) and Jukes *et al.* (2018)) that deserves more attention if we are to better understand the role of non-cognitive skills in educational production in South Africa.

## 9. Conclusion

Non-cognitive skills have become an important area of investigation in the economics of education internationally. South African research lags behind this fast-growing body of evidence in that only a handful of studies have investigated the association between non-cognitive skills and student achievement. The discussion in this paper was aimed at tracing the development, main findings, and limitations of the extant literature on non-cognitive skills in the economics of education, with a view to summarising what is known about these skills and their role in the learning process. It has been shown that non-cognitive skills have become central to the study of how learning outcomes are produced, and, as such, that these skills should be a major focus of South Africa's education research agenda going forward.

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