

# Classification of skills from education to the labour market

**How do we define the terms we use to describe the range of skills necessary to succeed in the education system and in the labour market? What are the fundamental theories that define the terminology? How are the terms used in different contexts and how do they overlap? What terminology should we use in relation to employability?**

**Author:** Milward, Kirsty: milward.bose@gmail.com

## Overview

### Definitions

There is a great deal of inconsistency and disagreement in the literature on how to classify skills, and therefore which precise skills belong into which broader grouping. Relatively uncontroversial is the group of 'cognitive skills'. These are 'thinking skills' associated with learning and formal IQ. They have been sub-classified into higher-order and lower-order thinking skills – including the abilities to remember understand, apply, analyse, evaluate and create – as well as into two domains of skills to organize thinking and response, and area-specific skills such as rules about particular areas such as numeracy.

The group of non-cognitive skills is less clearly defined or agreed. Most commentators include personality traits here – such as conscientiousness and extraversion, and often specified as the Big 5 personality traits. Many also include socio-emotional skills such as the skills to manage emotions and set and achieve goals. But there is much disagreement about the details of what precise skills belong in this group and also about these groupings are interrelated and affect each other.

Soft skills and life skills, meanwhile, are often used interchangeably, although soft skills are generally associated specifically with the world of work. Like the non-cognitive skills group, soft skills and life skills both include a number of socio-emotional skills such as self-management and relationship skills. Some definitions of life skills and soft skills also include some of the cognitive skills such as problem solving: thus according to some definitions, soft skills and non-cognitive skills are interchangeable, but in others they are not. How skills such as problem solving and critical thinking are classified is particularly inconsistent and illustrates this difficulty. While these are widely recognised as useful workplace skills, they are sometimes included with soft skills; at others they are treated in a separate category – neither cognitive nor socio-emotional, for example.

How skills are defined is also partly sector driven: The education sector most commonly uses the terminology of cognitive and non-cognitive skills. But 'life skills' terminology is also often used for the same skill group in the education sectors of low income countries. 'Life skills' however, are also associated with moves towards non-traditional pedagogical approaches. Life-skills education targets behaviours, attitudes and values, and is more effective using participatory methods and experiential and co-operative learning approaches. Thus life skills have become associated with these learning approaches. However, life-skills approaches have also been used extensively in sector-specific domains, particularly in health. Thus they have come to include some sector-specific knowledge.

Meanwhile, the terminology of ‘soft skills’ denotes non-cognitive skills as perceived from a work perspective. However, the employment sector also uses a broader grouping of desirable skills which includes cognitive and non-cognitive skills, sometimes called transferable skills or “core work skills”, and drawing on the ‘higher order thinking skills’ group in Bloom’s taxonomy. However, education systems, particularly traditional education systems, tend to focus on, and test/examine the “lower order” cognitive skills. Therefore the perceived learning gap expressed in **both** the employment focused literature and literature focused on quality education and new pedagogical approaches is focused on this area of “higher order thinking skills” or application, analysis, synthesis and evaluation.

## Implications for programming on FEE

For programming, it is important to specify skills by different interventions with more precision than these commonly used broad categories allow, at the same time as coming to an agreement on how skills should be grouped by broader definitions, and what is the expected relationship between them. For programmes aiming to improve employment prospects of young women in urban areas, this Brief recommends the following terminology:

- **Cognitive skills:** are ‘academic’ skills related to classic intelligence and include knowledge, comprehension, application, analysis, synthesis and evaluation – following Bloom’s 1956 taxonomy of thinking skills.
- **Non-cognitive skills:** are the Big Five broad personality traits of agreeableness, conscientiousness, emotional stability, extraversion and autonomy, PLUS socio-emotional skills such as self-awareness self-management, social awareness, relationship skills and responsible decision-making.
- **Soft-skills:** are non-cognitive skills, as seen from an employment perspective. They therefore include the same skill sets but emphasise work values such as team work, leadership, communication, cooperation and negotiation.
- **Problem-solving and critical thinking skills:** are cognitive skills or higher-order thinking skills which are recognised as having special value in the workplace.
- **Life skills:** are generally the same as soft skills but can also include sector-specific knowledge (such as health knowledge) and are associated with a broader approach emphasising participatory/interactive and experience-based learning methodologies.

Target skills for programming on FEE, according to these groupings, therefore potentially include soft skills/non-cognitive skills PLUS specified higher order cognitive skills, depending on the specific intervention. Approaches to learning may usefully draw on experience in promoting life skills. However, further specification of which skills are given priority within these groups will be needed. Identifying exactly which soft skills to target will be assisted by studies which help differentiate between types of work skills, including, for example, Taylor (2012).

### 1 Overlapping definitions

The debate on how to classify and define different areas of skills is lively and varied, and many aspects of this debate remain inconclusive. The literature on skills and skills development refers to various groupings and categories of skills. These include cognitive skills, non-cognitive skills, technical skills, soft skills, transferrable skills, vocational skills, core work skills and life skills. To some extent these groupings are driven by the various sectors in which they are used: education, employment, and health among others – discussed below.

***Since there is little consistency in the literature on which skills belong in which broad skills-grouping, it will be important to specify targeted skills with more precision than these commonly used broad categories allow.***

Unfortunately even within sectors there is often little consistency across different studies concerning which skills are referred to by which group label. While some of the categories are binaries – such as cognitive and non-cognitive skills, or soft skills and hard skills – and therefore one skill type cannot logically be placed in both – several categories are overlapping – such as life skills and transferrable skills – and therefore draw skills from more than one other grouping.

It is important to be aware of these inconsistencies in the literature. For both programme design and measurement it is likely to be important to specify targeted skills beyond the commonly used broad definitions which do not in fact refer to well-defined and agreed skill sets.

## 1.1 Foundational definitions

Although there remains much inconsistent usage, some classifications have in recent years been established as important, and have attracted some agreement.

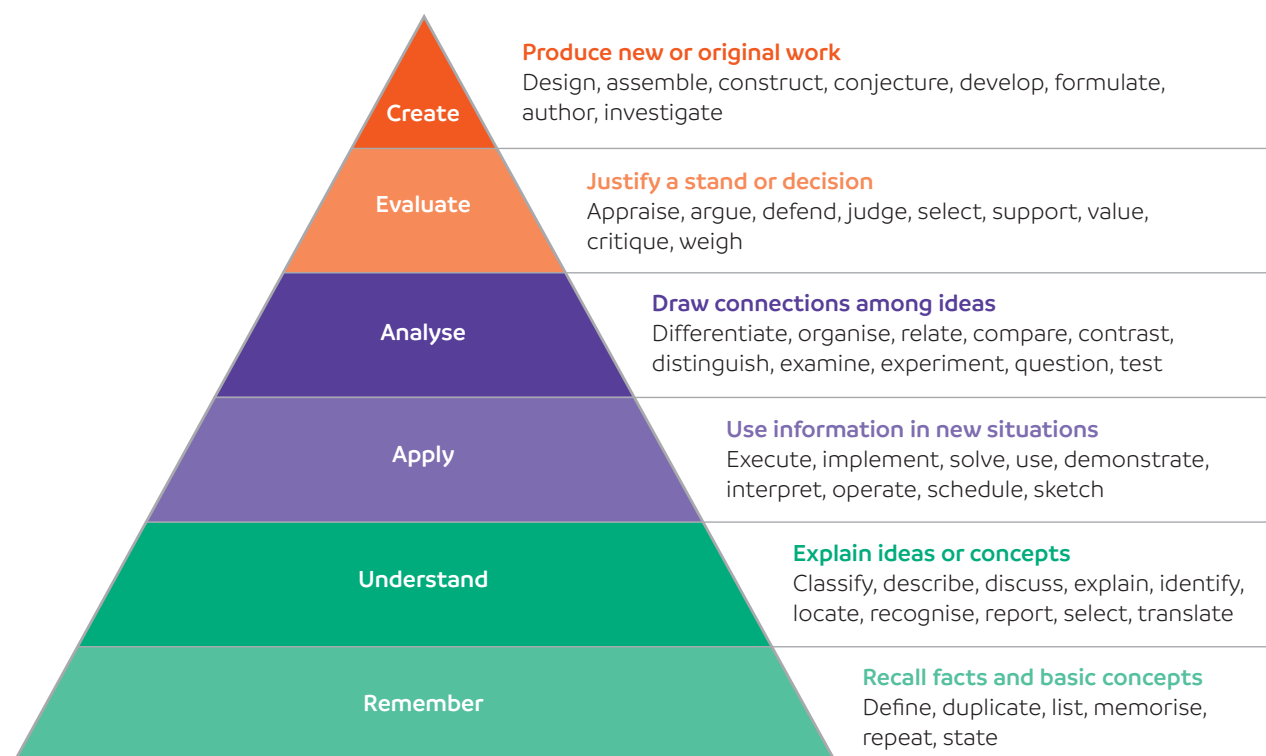
### Cognitive and non-cognitive skills

The broad distinction between cognitive and non-cognitive skills is well established even while there remains disagreement in particular about what should be included as a non-cognitive skill. Cognitive skills are the ‘thinking skills’. They are identified with intelligence and the ability to solve abstract problems; and measures of these skills include IQ testing and standardized testing on content areas such as reading, science, and mathematics (R4D 2012). They are often understood to be the standard ‘academic-type’ skills primarily fostered in traditional schooling systems, and include learning skills such as memory and attentiveness. A long-standing classification of types of cognitive skills rooted in education theory is that of Bloom’s taxonomy (1956) which groups cognitive skills into knowledge, comprehension, application, analysis, synthesis and evaluation (and, in a later version, “create”) (See Figure 1). These are arranged in a pyramid formation, with knowledge and comprehension at the bottom and evaluate and create at the top. Following this depiction, it has become common to refer to “lower order thinking skills” at the bottom of this pyramid and the “higher order thinking skills” represented at the top.

**Cognitive skills are ‘thinking skills’ associated with learning and formal IQ. They have been sub-classified into higher-order and lower-order thinking skills, as well as into domains of skills to organize thinking and response, and domain specific skills such as rules about particular areas such as numeracy.**

In other sub-classifications, Zlatko and Ajwad (2014) conceptualise cognitive skills as falling into two domains of “executive functioning skills” and “domain specific skills” The former are the capacities through which individuals organize their thinking and behaviour and respond to contextual cues and contingencies. The latter are the knowledge of ideas, facts, definitions and rules about specific domains such as literacy and numeracy. The authors note, however, that these domains are related because – for example – working memory actually contributes to the development on literacy and numeracy.

**Figure 1: Bloom’s taxonomy of cognitive processes**



Reproduced from: Patricia Armstrong, Center for Teaching, Vanderbilt University, Available at: <https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy>

Non-cognitive skills are clearly the opposite of cognitive skills, but there is less agreement on what they consist of. Several commentators take non-cognitive skills as the widely used list of Big Five broad **personality traits**: agreeableness, conscientiousness, emotional stability, extraversion and autonomy (R4D 2012).<sup>1</sup>

More specifically:

- agreeableness refers to the tendency to act cooperatively and in an unselfish manner;
- conscientiousness is the tendency to be organized, hardworking and responsible;
- emotional stability is the predictability and consistency in emotional reactions with absence of rapid mood changes;
- extraversion is the tendency to direct one's interest towards the outer world of people and things;
- autonomy – or sometimes “openness” – is the tendency to be open to new experiences (aesthetic, cultural or intellectual).

(See e.g. Paris *et al* 2015; Brunello and Schlotter 2011).

Some commentators – but not all – add a second group of skills in the non-cognitive category, of **socio-emotional skills**, defined as the learned knowledge, attitudes and skills necessary to understand and manage emotions, set and achieve positive goals, establish and maintain positive relationships, and make responsible decisions (Zlatko and Ajwad 2014; Paris *et al* 2015; Dusenbury *et al.* 2014). Some argue that these two sub-groupings of non-cognitive skills are very closely related because individuals with certain personality traits may tend to use certain socio-emotional skills (Zlatko and Ajwad 2014).

Others prefer to understand socio-emotional skills as among a separate group of psycho-social skills, beyond the non-cognitive group. Indeed, as Gutman and Schoon (2013) assert, discussion of non-cognitive skills remains complicated and contested: “There is little agreement even on whether ‘non-cognitive skills’ is the right way to describe the set of issues under discussion, and terms such as ‘character skills’, ‘competencies’, ‘personality traits’, ‘soft skills’ and ‘life skills’ are also widely used”.

### Socio-emotional skills, life skills and soft skills

Alongside the major distinction between cognitive and non-cognitive skills, different fields of enquiry concerned with “life skills” and “soft skills” have added some core distinctions through the elaboration of a range of psycho-social skills understood as critical for many aspects of human lives. The more established of these draw from both cognitive and non-cognitive skill pools to define their groupings. WHO, for example, working from a mental health perspective, initially identified five basic areas of life skills that are “relevant across cultures” (WHO 1999): decision-making and problem-solving; creative thinking and critical thinking; communication and interpersonal skills; self-awareness and empathy; and coping with emotions and coping with stress.

Meanwhile the Collaborative for Academic, Social and Emotional Learning (CASEL) (Dusenbury *et al* 2014) has identified five core groups of social and emotional competencies which are also widely referred to, and have only some features in common with WHO’s list:

- **Self-awareness** – accurately assessing one’s feelings, interests, values and strengths;
- **Self-management** – regulating one’s emotions to handle stress, and controlling impulses;

***In the group of non-cognitive skills, many commentators include personality traits – such as conscientiousness and extraversion – alongside socio-emotional skills such as the skills to manage emotions and set and achieve goals. But there is much disagreement about what skills belong in this group and the relationship between skills.***

***Soft skills and life skills are often used interchangeably, although soft skills are associated specifically with the world of work. Like the non-cognitive group, they both include a number of socio-emotional skills such as self-management and relationship skills. Some definitions of life skills and soft skills also include some of the cognitive skills such as problem solving.***

<sup>1</sup> Psychologists also use other taxonomies, including the Big Three, the MPQ, and the Big Nine (Kautz *et al* 2014).

- **Social awareness** – being able to take the perspective of and empathise with others;
- **Relationship skills** – establishing and maintaining healthy and rewarding relationships, resisting inappropriate social pressure, resolving conflict; and
- **Responsible decision-making** – making decisions based on appropriate social norms, respect for others, applying decision-making skills to academic and social situations.

Life skills and soft skills are also widely used categories, and are often used interchangeably, although soft skills are more associated with the world of work, whereas life skills are applied in a range of different contexts, indeed are seen in a general sense – following UNICEF – as skills “that enable people to interact appropriately, manage their own emotional states and make decisions and choices for an active, safe and productive life”. UNICEF’s classification of 3 types of “generic life skills” (UNICEF 2010) is widely accepted. These group skills into one group of cognitive and two groups of non-cognitive skills:

- **Cognitive** – critical thinking and problem solving skills for responsible decision-making;
- **Personal** – skills for awareness and drive and for self-management; and
- **Inter-personal** – skills for communication, negotiation, cooperation and teamwork, and for inclusion, empathy and advocacy.

## 1.2 Examples of variation: What skill type are problem solving and critical thinking?

Particular care is needed with certain types of skills which are often assigned to different categories, and even to opposing categories within the same binary groups. Notably, where “problem solving” and “critical thinking” belong as skill types.

As noted above, UNICEF’s 3-level distinction for understanding life skills places problem solving (for responsible decision making) and critical thinking in the ‘cognitive’ grouping. As suggested above, education theory also places critical thinking and problem solving in the group of “higher order thinking skills” placed towards the top of Blooms Taxonomy of “the cognitive domain”: they are associated with the “application” “analysis” and “evaluation” spheres of Bloom’s pyramid. Brown *et al* (2015) also follow this ‘cognitive skill’ categorisation for decision making, critical thinking and problem-solving.

However, the World Bank Group in the STEP (Skills Towards Employment and Productivity) skills measurement program (World Bank Group 2014), places problem solving in a category of ‘job relevant skills’ separated from both cognitive and socio-emotional skills. In addition, especially in employment-focused literature, problem solving and critical thinking are often included among the “soft skills” or “transferrable skills” seen as valuable to both employers and employees alike. The Education Development Centre, for example, designing Akazi Kanoze 2 (MCF 2014) in Rwanda includes critical thinking and problem solving alongside time management and self-awareness in “soft skills”. From a private-sector employer’s perspective, problem solving stands alongside creativity as a soft skill (DEG and BCG 2016). ILO meanwhile, includes “thinking creatively” and “solving problems” alongside working in teams and handling basic technology in its ‘core works skills’ definition, without referring to the cognitive or non-cognitive grouping (ILO 2013).

***How skills such as problem solving and critical thinking are classified is particularly inconsistent, but they are widely recognised as useful workplace skills. For programming on FEE, recognising their value at work at the same time as defining them as cognitive skills is the suggested way forward.***

For the purposes of programming for FEE, recognising critical thinking and problem solving skills as cognitive skills which are regarded as particularly desirable skills in work places is a clear way forward. This allows them to be understood as (higher order) thinking skills rather than being associated with the personality traits and socio-emotional skills group under ‘soft skills’ or ‘life skills’.

## 2 Sector contexts

Part of the reason for inconsistency in the terminology of skills is that the vocabulary of skills has developed in the contexts of sectors which are interested in different sets of skills.

### 2.1 Education

In the education sector, the most common distinction has been between cognitive and non-cognitive skills, with cognitive skills as the academic skills the education sector is traditionally primarily concerned with enhancing, and non-cognitive skills as the group of 'non-academic' skills asserted as important to many dimensions of education – and in particular “lifelong learning” (see R4D 2012) – by alternative and more recent education theorists/commentators. High income countries – with their longer experience of universal education and its relation to the economy – have been especially involved with this discussion, which is connected to conceptions of the proper nature and purpose of national education systems, and policy questions of how to put this purpose into effect.

In developing countries, the discussion on alternative skills to be promoted within education is more likely to take on the terminology of life skills. However, applications of “life skills” thinking are not confined to the education sector.

### 2.2 Employment

The world of work has a different focus, and from it some different and overlapping skill categories have emerged. Brown *et al* (2015) among others, discuss “transferable skills” – being those work skills which an individual can apply to different tasks in various forms of employment. Transferable skills are “higher-order cognitive and non-cognitive skills that individuals can use to succeed in different situations in work and life.” There are many terms that overlap with this definition, including soft skills, character skills, personality traits, non-cognitive skills, 21st-century skills and life skills (Brown *et al* 2015).

The ILO also draws on cognitive and non-cognitive groupings to define its “core work skills” category, in which are included basic education skills; technical skills needed for particular occupations as well as “the abilities to learn and adapt; to read, write and compute competently; to listen and communicate effectively; to think creatively; to solve problems independently; to manage oneself at work; to interact with co-workers; to work in teams or groups; to handle basic technology; and to lead effectively as well as follow supervision.”

However, it is also from the employment sector that the vocabulary of “soft skills” has emerged, broadly identifying interpersonal and personal (non-cognitive) skills which form the platform from which cognitive skills can be put to effective use. “Soft skills” also often identify a group of skills which employers tend to find lacking in young workers because schools have not focused on them – i.e. non-cognitive skills which schools generally de-prioritize in favour of cognitive skills (e.g. BCG 2016; ILO 2013).

***The education sector most commonly uses the terminology of cognitive and non-cognitive skills. But ‘life skills’ terminology is also commonly used for the same skill group in the education sectors of low income countries. ‘Life skills’ however, are also associated with moves towards non-traditional pedagogical approaches.***

***The terminology of ‘soft skills’ denotes non-cognitive skills as perceived from a work perspective. However, the employment sector also uses a broader grouping of desirable skills which includes cognitive and non-cognitive skills, sometimes called transferable skills or “core work skills”.***

### 2.3 Life Skills for HIV prevention and other content-specific issues

Life skills remains a broad category, with different organisations defining and specifying their content somewhat differently. Core understanding of life skills education (LSE) as an approach, includes behaviours, attitudes and values as part of what is being addressed, alongside knowledge and skills. Targeting these areas implies using non-standard teaching and learning approaches, involving participatory methods and experiential and cooperative learning. Thus life skills education has become associated with new pedagogical approaches, also increasingly promoted in the formal education sector – this is discussed further in *Skills and Schools*.<sup>2</sup>

As for other categories of skills, the content of “life skills” varies according to the sector driving their promotion, and may include knowledge associated specifically with that sector. The drive to equip populations to protect themselves against HIV has been an important vehicle for the promotion of life skills approaches. This has seen hundreds of initiatives addressing sexual and reproductive health, which seek to develop learners’ knowledge of areas such as puberty and HIV transmission and prevention, alongside the behavioural skills required to avoid risky sexual activity, and attitude changes to increase self-esteem and self-efficacy and to respect the rights of those living with HIV (UNICEF 2012).

***Life-skills education targets behaviours, attitudes and values, and is more effective using participatory methods and experiential and co-operative learning approaches. Thus life skills have become associated with these learning approaches. However, life-skills approaches have also been used extensively in sector-specific domains, particularly in health. Thus they have come to include some sector-specific knowledge.***

Life skills approaches have also been used to promote citizenship, equip (young) people for disaster risk reduction, and to promote gender equality particularly among adolescents. Each of these thematic areas has influenced the content of the life skills promoted. All, however, emphasise communication skills, negotiation and mediation, and to some extent a critique of the social environment.

Life skills have also attracted the interest of economists trying to identify ways to reduce poverty and redress socio-economic inequalities. A World Bank multi-country study, for example, found that psycho-social competencies, including resilience, personal agency and self-confidence, can help a person move up and out of poverty (Narayan *et al.* 2009). This is also referenced in the study ‘Winning Personality’ A WINNING PERSONALITY The effects of background on personality and earnings by Dr Robert de Vries and Dr Jason Rentfrow January 2016 – based on a longitudinal study in Britain.

<sup>2</sup> Brief commissioned by MUVA.

## References

- Brown, Annette N., Kristen Rankin, Mario Picon and Drew B. Cameron (2015) "The state of evidence on the impact of transferable skills programming on youth in low- and middle-income countries" 3ie Scoping Paper 4, International Initiative for Impact Evaluation (3ie).
- Brunello, Giorgio and Martin Schlotter (2011) "Non Cognitive Skills and Personality Traits: Labour Market Relevance and their Development in Education & Training Systems", IZA discussion Paper No 5743, May.
- DEG (Deutsche Investitions- und Entwicklungsgesellschaft) and Boston Consulting Group (BCG) (2016) "Bridging the skills gaps in developing countries A practical guide for private-sector companies", Prepared for the Association of European Development Finance Institutions (EDFI) within the Let's Work Partnership, January.
- Dusenbury, Linda, Roger P. Weissberg, Paul Goren, & Celene Domitrovich (2014) "State Standards to Advance Social and Emotional Learning – Findings from CASEL's State Scan of Social and Emotional Learning Standards, Preschool through High School", Publication of the Collaborative for Academic, Social, and Emotional Learning (CASEL), January.
- Gutman, Leslie Morrison and Ingrid Schoon (2013) "The impact of non-cognitive skills on outcomes for young people", Literature review, Institute of Education and Education Empowerment Foundation, 21 November.
- ILO (2013) "Enhancing youth employability: The importance of core work skills", SKILLS FOR EMPLOYMENT, Policy Brief, ILO.
- Kautz, Tim, James J. Heckman, Ron Diris, Bas ter Weel, Lex Borghans (2014) "Fostering and Measuring Skills: Improving Cognitive and Non-Cognitive Skills to Promote Lifetime Success", IZA DP No. 8696, Institute for the Study of Labor, December.
- MCF (Master Card Foundation) (2014) "Training Youth in Transferable Skills: State of the Evidence" Part of the Akazi Kanoze 2 Initiative, Education Development Centre. Available at <http://www.mastercardfdn.org/training-youth-in-transferable-skills/>
- Narayan, D, Lant et al. Pritchett, and Soumya Kapoor (2009), "Moving out of Poverty Volume 2. Success from the Bottom Up", World Bank.
- Paris, Anne Hilger, Christophe J. Nordman, Leopold R. Sarr (2015) "Cognitive and Non-cognitive skills, Social networks, and Wages in Bangladesh" DRAFT, June 10. Available at [http://www.iza.org/conference\\_files/worldb2015/hilger\\_a22130.pdf](http://www.iza.org/conference_files/worldb2015/hilger_a22130.pdf)
- Results for Development Institute (R4D) (2012) "Skills for Employability: Economic Returns to Education and Skills" Innovative Secondary Education for Skills Enhancement (ISESE), R4D, July.
- Taylor, Estelle (2016) "Investigating the Perception of Stakeholders on Soft Skills Development of Students: Evidence from South Africa", Interdisciplinary Journal of e-Skills and Lifelong Learning, Vol 12.
- UNICEF (2012) "Global Life Skills Education Evaluation: UNICEF Draft Final Report" Education for Change Ltd., February.
- WHO (1999), "Partners in Life Skills Education: Conclusions from a United Nations Inter-Agency Meeting", WHO/MNH/MHP/99.2, Geneva.
- World Bank Group (2014) "STEP skills measurement program – Snapshot", Available at [http://www.worldbank.org/content/dam/Worldbank/Feature%20Story/Education/STEP%20Snapshot%202014\\_Revised\\_June%2020%202014%20\(final\).pdf](http://www.worldbank.org/content/dam/Worldbank/Feature%20Story/Education/STEP%20Snapshot%202014_Revised_June%2020%202014%20(final).pdf)
- Zlatko, Nikoloski and Mohamed Ihsan Ajwad (2014) "Cognitive and Non-Cognitive Skills Affect Employment Outcomes: Evidence from Central Asia", Available at [www.iza.org/conference\\_files/CognitiveSkills\\_2014/nikoloski\\_z6495.pdf](http://www.iza.org/conference_files/CognitiveSkills_2014/nikoloski_z6495.pdf)