

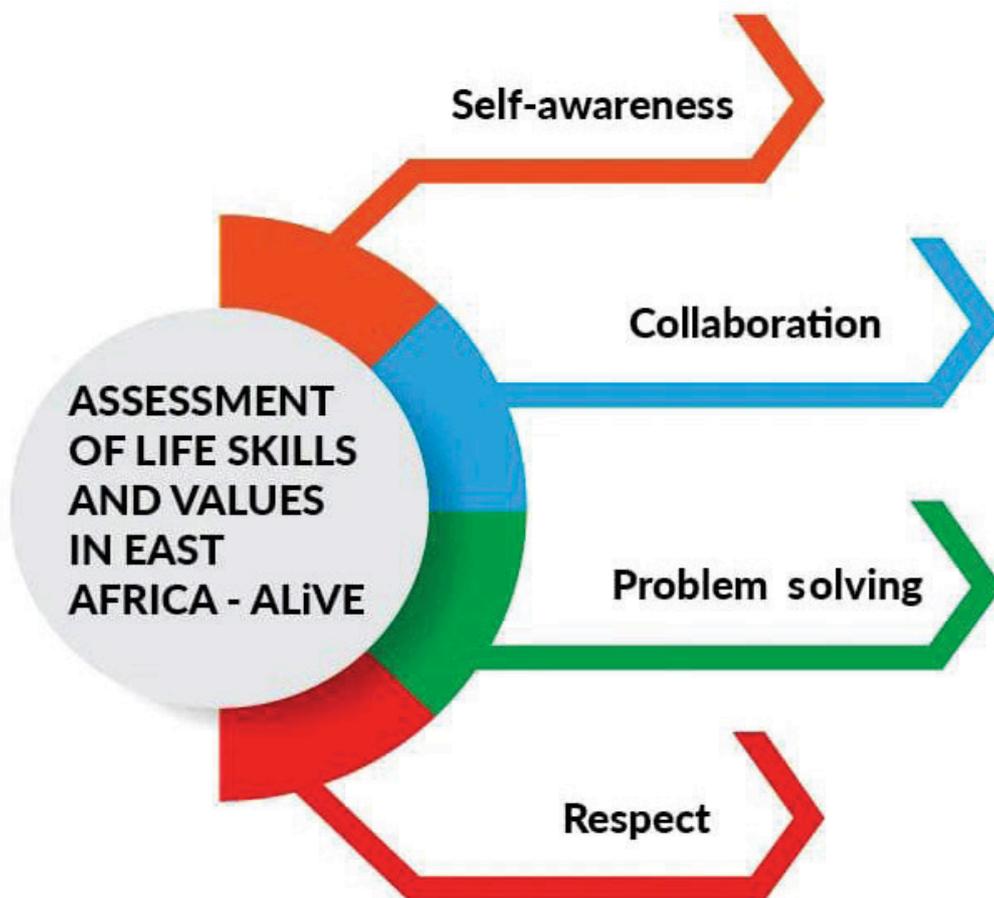
Assessment of Life Skills and Values in East Africa (ALiVE)

*Proficiency Levels of Adolescents in Life Skills and Values
in Kenya, Tanzania, and Uganda*



REGIONAL REPORT

JUNE, 2023



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Foreword

We are well on our way to the year 2040. Following the harmonization of education curricula in East Africa that was completed ten years ago, the teaching of life skills and values is routine in every classroom. Learning assessments indicate that more than 90% of our children read with fluency and comprehension by the end of grade three. This follows the massive investment in the training of teachers and the effective application of technology to improve learning everywhere. We no longer have crowded classrooms because children alternate between learning at school and connecting virtually from home and the satellite learning centres constructed by the government.

The scenario described above is the future we envisage. It gets us out of bed every morning. Our vision is that the schooling generation acquires the needed competencies to navigate the complexities of the 21st century. The Assessment of Life Skills and Values in East Africa (ALiVE) is a journey of hope. When we started in 2020, there were only a few assessments of these competencies in East Africa. A study commissioned by Echidna Giving and completed in 2019 established that 75% of the traced assessment tools available were standardized questionnaires, mostly self-rating scales and ratings by others. Most of these had been developed in the global north context. Eighty-three percent (83%) of the people interviewed expressed the thirst to participate in a collective impact initiative, to learn how to develop these tools for the East African context.

ALiVE has risen to this challenge. This report is a product of collaborative work among more than 2,000 people across Kenya, Tanzania, and Uganda. A contextualized tool developed via a learning-through-doing approach by 47 people, advisory teams of more than 25 local experts, more than 100 trainers, and close to 800 assessors. This work is evidence of fortitude and our story of self-empowerment. But the journey has just begun. It will not be over until teachers and parents understand the value of these competencies and homes and classrooms become nurturing grounds for life skills and values. We acknowledge the role played by all our partners across the three countries in making this work a success, including the sampling experts from the national bureaus, the lead analyst Martin Ariapa and our technical team lead, Prof. Esther Care.

Together, we will realize our dream.

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Assessment of Life Skills and Values in East Africa (ALiVE)

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1.0 INTRODUCTION

Evidence shows that high levels of life skills support adolescents' abilities to cope with emotional, educational, and behavioural challenges in all aspects of their lives (UNICEF, 2020). But despite the global concern for life-skills education (UNICEF, 2012), coupled with the introduction of competency-based curricula in Kenya, Tanzania, and Uganda that emphasize the teaching and learning of life skills and values, it is unclear how these have been assessed. Therefore, in order to generate large scale data on life skills and values among young people, the Regional Education Learning Initiative (RELI) commissioned an initiative called Assessment of Life Skills and Values in East Africa (ALiVE), which purposed to collaborate with local leaders to create and develop contextualized assessments in East Africa.

Over the three years (2020–2023), the objectives of the ALiVE initiative were the following:

- a. To develop contextualized, open-source tools for assessment of life skills and values in the East African context;
- b. To generate large-scale data on life skills and values across the three countries;
- c. To use the evidence to inform change and build capacities within the values and life skills member organizations.

The goal of the initiative is to support the four national education systems in their focus on these competencies, inform regional policy throughout the East African Community, and contribute to global knowledge on the measurement of life skills and values in context.

To achieve the stated objectives, the ALiVE initiative focused on developing an assessment of three life skills (collaboration, problem solving, and self-awareness) and one value (respect) which were prioritized through a series of consultative meetings with organizations implementing interventions on life skills and values in East Africa. The assessment targets both in-school and out-of-school adolescent boys and girls between 13 and 17 years of age. Embracing the Sustainable Development Goals (SDG) spirit of leaving no one behind, the initiative conducted the assessment at the household level. The aspiration was to use a simple and easy-to-use tool, making it feasible and affordable to conduct such an assessment on a national scale.

The ALiVE tool was developed through a participatory process that started with a contextualisation study designed to explore the nature of the selected life skills and value in the East African community. From the contextualisation study, the conceptual structures of the target constructs were agreed upon, followed by development of assessment frameworks that identified the measurable components of those constructs. Guided by the assessment frameworks, the ALiVE team embarked on task and item development in April 2021, and finalised the large-scale assessments by August 2022, reaching 45,442 adolescents.

This report describes the development and validation of the tool designed to measure proficiencies demonstrated by adolescents from 13 to 17 years of age in Kenya, Tanzania, and Uganda, in the three life skills and one value. Furthermore, the report provides results from the large-scale household-based assessment that used the tool. The information provides the background for the assessment results that are needed to inform policy of the participating countries as they seek to include life skills and values in their national curricula.

2.0 METHODS

2.1 Design

Several factors influenced the design of the ALiVE tool:

- a. The ALiVE tool was designed to get a glimpse of functioning across life skills and values, as aspired to by ministries of education in the respective educational jurisdictions. The assessments were not designed for diagnosis of individual functioning but rather to establish a basis upon which countries might evaluate their educational goals given their embrace of life skills and values in recent years, and to inform their curricular planning.
- b. The ALiVE tool was concerned with a representative sample of the participating countries' adolescents who might be in or out of school. This interest, therefore, required household-based assessment. This medium for assessment, in turn, requires manageable interactions in the field that are distinct from interactions that can be managed at the group level in a formal education environment. Manageability in the field implies assessment forms that can be communicated orally, in time-efficient ways, and through content such as daily life scenarios that are not reliant on school-based learning.
- c. The ALiVE team committed considerable effort to defining and describing the target constructs. This was undertaken both due to observance of a well-established test and scale development model and due to the combination of two relatively recent innovations: first, the assessment of 21st century skills remains in its early days; and second, household-based assessment at large scale has emerged in the past decade as an acceptable and sufficiently stringent approach to collection of data that prompts government action. Ensuring a common understanding of the target competencies is not only essential in the routine test and scale development processes, but in ensuring the same understandings when hundreds of Test Administrators and other personnel are involved in data collection.

2.2 Sample

The sampling frame used for this study was derived from the Population and Housing Census' frames for the four jurisdictions of Kenya, Tanzania Mainland, Tanzania Zanzibar, and Uganda. This frame includes a complete list of census enumeration areas and households. In each jurisdiction, a multi-stage sampling approach was used to select households and adolescents for the study. The approach involved selection of districts/counties, followed by the selection of enumeration areas (EA); and finally, selection of households within each selected EA. The desired sample sizes were determined by considering the degree of precision desired for the study estimates, the cost and operational limitations, and a fixed number of households per EA. A total of 45,442 in-school and out-of-school adolescent boys and girls from ages 13 to 17 from 35,720 households, 1,991 enumeration areas, and 85 districts/counties were assessed, as shown in Table 1.

Table 1: Sampling across Districts, Enumeration Areas, and Households

Variables	Kenya	Tanzania	Uganda	Zanzibar	Total
Districts/counties	20	34	20	11	85
Enumeration areas	798	673	400	120	1,991
Households	14,161	11,802	7,815	1,942	35,720
Adolescents (problem solving, self-awareness, and respect)	17,276	14,645	11,074	2,447	45,442
Adolescents (collaboration)	7,494	6,827	4,476	1,319	20,116

Just 18 fewer than the planned allocations for the EA were reached. Approximately 10% fewer than planned households were reached. Discrepancies in both cases were distributed across each of the jurisdictions. Sampling weights calculated based on sampling probabilities for each sampling stage were used in the analyses to ensure that the results accurately reflect the characteristics of the population being studied. Adjustments for non-response were also made by including the household response rate adjustment factor in the sampling weights.

2.3 Data Analysis

For the three life skills and the value, classical test theory was first used to investigate the functioning of items included in the tools. The following were specifically reviewed: the distribution of responses across items; the patterns of responses for each item by country, gender, age, and education levels of the adolescents. Reliability coefficients were then calculated to establish the scales' coherence.

The Rasch model was used to explore and quantify the participants' responses. Using the Rasch model provided tools for interpreting skills that underpin constructing and developing empirical proficiency levels. Proficiency levels describing increasing competency levels were developed for the overarching constructs. Following these test and scale development processes, further analyses were performed to explore the four constructs across jurisdictions and by selected variables: gender, education level, adolescent age, and disability status.

Finally, based on the Rasch model analysis outputs, researchers recognized patterns regarding increasing proficiencies across the main scales and subscales for collaboration, problem solving, self-awareness, and respect. The results demonstrated the utility of the rubrics used for coding responses.

3.0 RESULTS

3.1 Demographic Characteristics Of Adolescents

The distribution of the assessed adolescents across countries, genders, ages, and education levels, is shown in Table 2.

Table 2: Gender, Age Distribution, and Education Status of Adolescents

	Male n(%)	Female n(%)	Other n(%)	Total n(%)
Gender	22,092(48.6)	23,264(51.2)	86(0.2)	45,442(100.0)
Country				
Kenya	8,128(47.1)	9,123(52.8)	25(0.1)	17,276(38.0)
Tanzania	7,469(51.0)	7,162(48.9)	14(0.1)	14,645(32.2)
Uganda	5,354(48.4)	5,681(51.3)	39(0.4)	11,074(24.4)
Zanzibar	1,141(46.6)	1,298(53.0)	8(0.3)	2,447(5.4)
Age group				
13-14 years	10,699(48.4)	11,860(51.0)	46(53.5)	22,605(49.7)
15-17 years	11,393(51.6)	11,404(49.0)	40(46.5)	22,837(50.3)
Schooling status				
In school	18,842(85.3)	20,555(88.4)	73(84.9)	39,470(86.9)
Out of school	3,250(14.7)	2,709(11.6)	13(15.1)	5,972(13.1)
Education level				
Primary	14,956(67.7)	14,602(62.8)	53(61.6)	29,611(65.2)
Secondary	6,015(27.2)	7,586(32.6)	28(32.6)	13,629(30.0)

Younger and older adolescents were almost equally distributed across the two main age ranges (13–14 years and 15–17 years). Approximately 13% of the adolescents assessed were out of school, that is, not currently studying. For this 13%, the highest level of education was recorded as primary or secondary. About 30% of all adolescents assessed reached the secondary education level, and 65% reached primary education level. Note that there is some variation across the four jurisdictions in terms of defining Grades 7 or 8 to primary versus secondary education.

Adolescents' Disability Status

Disability status of the adolescents was determined using the Washington Group Short Set of Questions. Parents were asked whether their children had any difficulty in vision, hearing, walking, memory, self-care, and language/communication and how severe such a difficulty was. Across the four jurisdictions, parents reported about 12% of the adolescents (11.5% males and 12.3% females) aged 13 to 17 years had at least one form of difficulty. Table 3 provides the occurrence of the identified difficulties.

Table 3: Identified Difficulties across the Countries

Variable	Kenya	Tanzania	Uganda	Zanzibar	Regional
	% of adolescents (n=45,442)				
Identified difficulties					
Seeing difficulty	5.9	3.1	3.8	3.8	4.4
Hearing difficulty	2.1	1.6	3.2	2.7	2.3
Walking difficulty	1.6	1.4	3.4	0.9	1.9
Memory difficulty	3.7	2.5	8.1	3.4	4.4
Self-care difficulty	1.3	0.9	2.5	0.7	1.4
Communication difficulty	1.5	1.0	2.2	0.9	1.5
Disability status					
No form of disability	87.8	92.0	83.1	88.9	88.1
At least 1 form of disability	12.2	8.0	16.8	11.1	11.9
Note: The adolescents' difficulty level reported in this table included, "some, a lot, and total difficulty"					

Seeing and memory difficulties registered the highest rates in Kenya and Uganda, respectively. The lowest rates were registered in self-care and communication difficulties across all jurisdictions.

Adolescents' Proficiencies Beyond Basics Literacy

Adolescents were asked to read as fluently as they could from a short text that was extracted from the Uwezo Beyond Basics Literacy Assessment, targeted towards the Primary 4 standard. Thereafter, adolescents who managed to read the text were asked three comprehension questions related to the text. About 23% of the adolescents (17.5% males and 16.0% females) were completely unable to read the text. For adolescents who were able to read the text, the assessors followed their reading process in order to ascertain whether they were reading sentences as a string of words, stopping or hesitating while reading, omitting or skipping the reading of some words or sounds, or replacing words or sounds that they were unable to read. Adolescents who did not demonstrate any of these behaviours are categorized as fluent readers. Based on these parameters, 34% of the adolescents (31% males and 36% females) are regarded as fluent readers.

Figure 1 shows the percentage of adolescents regarded as fluent readers by jurisdiction. Kenya has the highest number of adolescents regarded as fluent readers, while Uganda counts the lowest number.

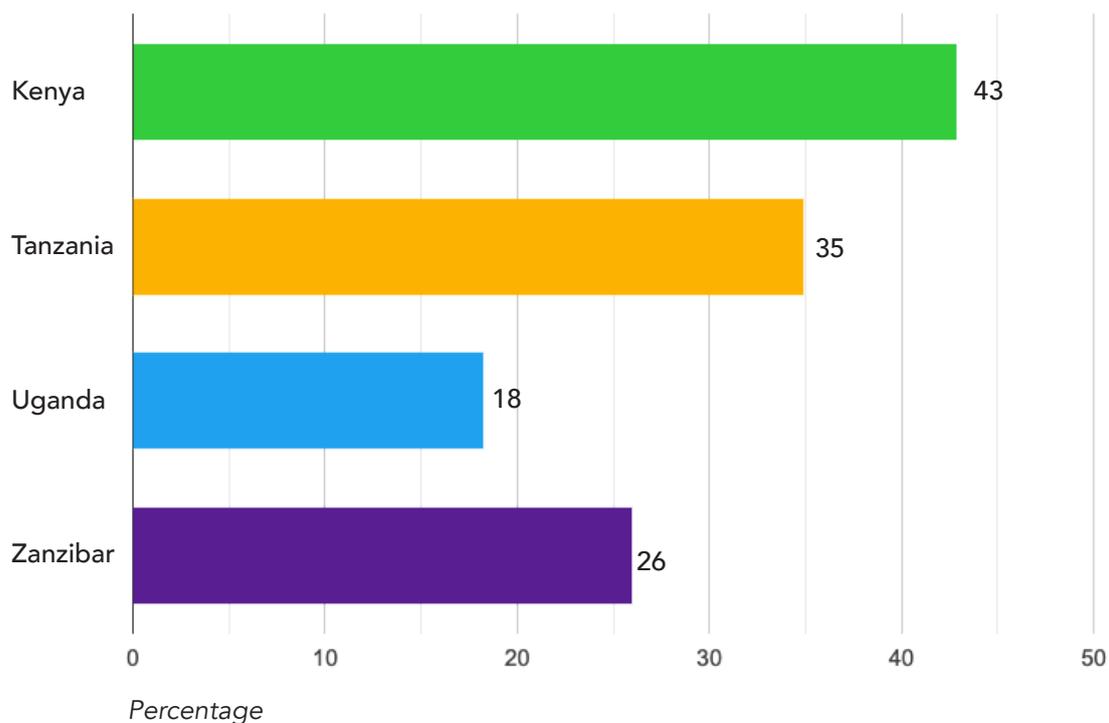


Figure 1: Adolescents Regarded as Fluent Readers by Country

The reading task was followed by comprehension questions. Analysis of this data shows that 3 in 10 adolescents (29% males and 31% females) responded correctly to all three questions from the text. A third of the adolescents (36% males and 31% females) did not respond correctly to any of the three questions.

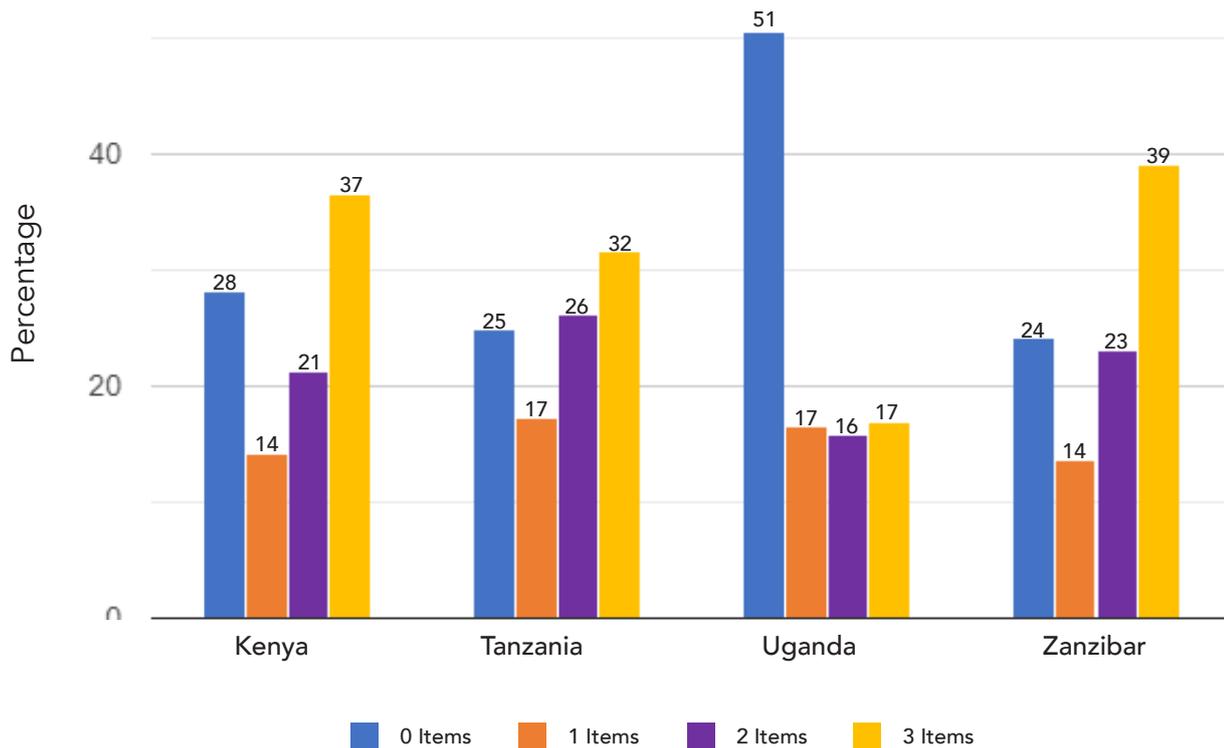


Figure 2: Beyond Basics Literacy Comprehension Items by Country

Adolescents' Digital Literacy

In order to understand the digital literacy of adolescents, researchers asked them how often they use devices such as computer or tablet, feature phone, television, and radio. Adolescents who use the devices either every day or at least once a week but not every day, are considered to be regular users of technology. With this benchmark, about 19% of adolescents (20% males and 17% females) are regular users of computers or tablets; 36% are regular users of feature phones (38% males and 34% females); 51% are regular users of radio (52% males and 49% females); and 43% are regular users of television (43% males and 43% females). Adolescents who have not reached this benchmark, have either never used the technological device, used it less than once a month, or have used it at least once a month but not every week.

¹ The three comprehension questions were (i) What was Musa's grandmother doing when Musa visited the farm? (ii) How can you tell that the farm is big? and (iii) What two animal products are you likely to get from this farm?

² A feature phone, also known as a basic phone or "dumb phone," is a type of mobile phone that provides basic calling and messaging functionality but lacks the advanced capabilities and features found in smartphones. Unlike smartphones, feature phones typically have limited internet access, smaller screens, physical keypads, and basic operating systems.

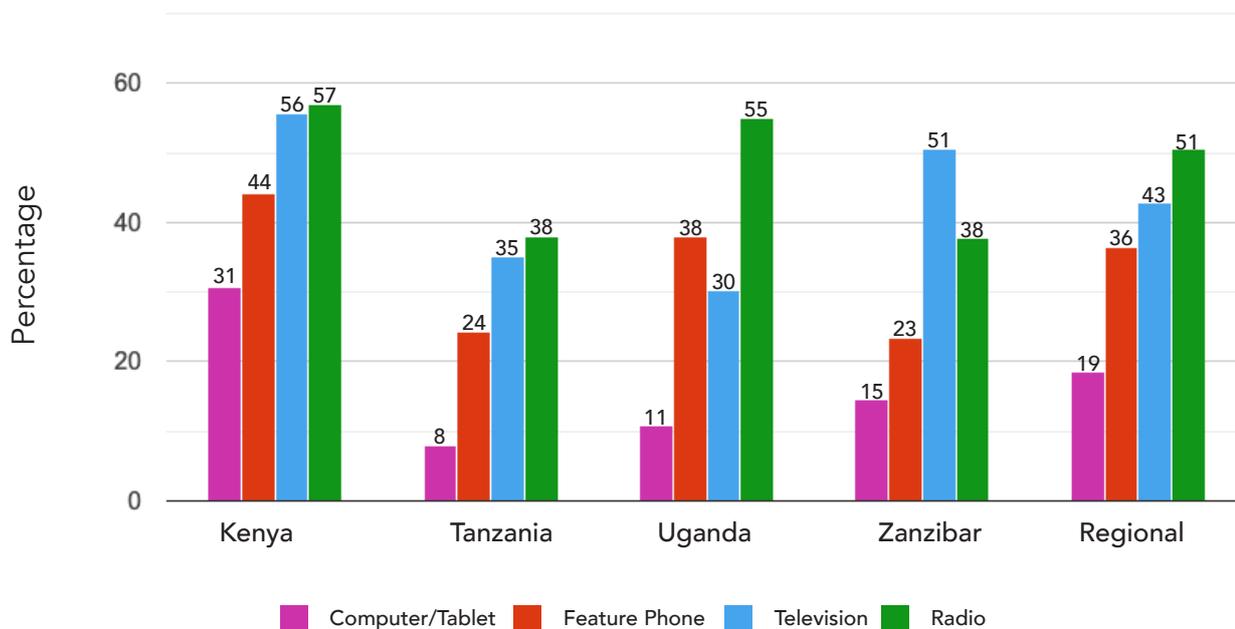


Figure 3: Regular Users of Selected Technological Devices

It is noticeable that use of a computer/tablet is least frequent, and that use of radios is the most frequent. Overall, devices are most frequently used in Kenya. As reported by the adolescents, televisions are most frequently used in Kenya and Zanzibar, while radios are most frequently used in Kenya and Uganda.

Adolescents' ability to use technology was also explored. Each adolescent was given a smartphone or tablet in the assessment session and was asked to access the internet and visit their favourite website. In case of no connectivity, assessors observed and noted whether the adolescent was able to locate an app or click on it. About 31% (32% males and 29% females) of the adolescents were able to do the task with ease. About 48% of the adolescents (47% males and 49% females) were unable to use the technology. The rest were able to locate an app or click on it, but with some difficulty.

Table 4: Use of Technology to Access the Internet and Favourite Websites or Apps

Ability to use the Technology	Country	Gender		Age (years)		Overall
		Male	Female	13–14	15–17	
	% of adolescents (n=45,442)					
Does with ease	Kenya	52.0	47.8	43.8	55.2	49.7
	Tanzania	18.5	13.0	10.6	20.8	15.8
	Uganda	18.3	14.8	9.8	23.5	16.5
	Zanzibar	36.5	25.6	21.6	39.4	30.8
	Regional	32.4	28.9	24.4	36.6	30.6
Does but with difficulty	Kenya	21.3	24.5	24.0	22.1	23.1
	Tanzania	23.9	20.8	20.6	24.1	22.4
	Uganda	16.2	18.9	14.8	20.5	17.6
	Zanzibar	25.8	27.0	27.6	25.4	26.5
	Regional	20.8	22.0	20.5	22.3	21.4
Is unable to	Kenya	26.7	27.7	32.1	22.6	27.2
	Tanzania	57.6	66.3	68.9	55.2	61.8
	Uganda	65.5	66.3	75.3	56.1	65.9
	Zanzibar	37.8	47.5	50.8	35.1	42.8
	Regional	46.8	49.1	55.2	41.1	48.0

Adolescents in Kenya and Zanzibar are more able to use digital technology than those in Uganda and Tanzania. More females than males are unable to use the smartphone or tablet for internet or access to websites or apps. Older adolescents are more able than younger in use of the technology.

Assessment of Collaboration, Problem Solving, Respect, and Self-Awareness

The four constructs, including three life skills and one value, are targeted through the use of scenario-based and performance-based tasks. Due to the nature of the planned assessment and the desired results structure, the overall tool that covers all four constructs was designed to be relatively easy to administer and score, and to gather indicators of the competencies in ways that would be simple to report. The assessment is therefore not designed to generate results that would comprehensively describe any one individual, but rather to produce more general indications of key competencies at population levels.

For administration of the tool for problem solving, respect and self-awareness, each task is read out loud to the adolescent. This is followed by asking a series of questions, the answers to which provide item-level data. The coding of responses is enacted in real time, with test administrators who are familiar with the coding rubrics, encoding the responses into the KoboCollect application installed on handheld devices. Note that the quality of responses is determined by reference of these to the criteria set for identification across the levels of proficiency provided for each construct. The administration procedure is slightly different for collaboration. The assessment tasks are performance-based, and instructions for each step in a collaboration activity are provided. In this instance, the behaviours of the adolescents at each step are observed, and again encoded and compared to the criteria set for estimating levels of proficiency in KoboCollect.

The following sections provide information for each construct, in terms of structure of the tool, distribution of responses across factors of interest, and psychometric information that lends confidence to claims of validity. The most comprehensive explanatory narrative is provided for the first construct treated: problem solving. One can refer back to this additional text as necessary when reading about the remaining three constructs.

This section describes that part of the ALiVE tool ('the tool') used to gather data on the problem-solving (PS) proficiencies of the adolescents and describes those proficiencies.

3.1 Problem Solving

The problem-solving assessment consists of three tasks. Each task consists of a brief description of a situation, associated with four items, each of which targets a different aspect of an adolescent's PS proficiency. All three tasks follow the same pattern, with their four items targeting a 'step' or process approach to PS. The first two items of a task assess the adolescent's recognition of the problem, followed by gathering of relevant information. The second two items assess the adolescent's exploration of alternative solutions and selection of best solution. The first two steps can be conceptualised as defining the problem, and the second two as finding the solution (Table 5). Elsewhere, these conceptualisations are referred to as dimensions. The tasks are numbered 1, 3, and 4 (a numbering convention derived from the development of the PS tool which included 9 tasks in field testing). The final tool provides 12 data points recording adolescents' completion of all three tasks, each with its four items. There are no 'a' items reported since the subskill targeted was analogous to the 'b' items target, and the 'a' items became redundant.

Table 5: Tasks and Items Contributing to the Problem-Solving Scales

Constructs		Items	#
Problem solving		PS1b, PS1c, PS1d, PS1e, PS3b, PS3c, PS3d, PS3e, PS4b, PS4c, PS4d, PS4e	12
Skill Dimensions	Defining the problem [b, c]	PS1b, PS1c, PS3b, PS3c, PS4b, PS4c	6
	Finding the solution [d, e]	PS1d, PS1e, PS3d, PS3e, PS4d, PS4e	6
Subskills	Recognizing the problem [b]	PS1b, PS3b, PS4b	3
	Information gathering [c]	PS1c, PS3c, PS4c	3
	Exploring alternative solutions [d]	PS1d, PS3d, PS4d	3
	Selecting the solution [e]	PS1e, PS3e, PS4e	3

For the assessment, each task is read out loud to the adolescent. This is followed by asking questions, the answers to which provide item-level data. The coding of responses is enacted in real time, with test administrators (being familiar with the coding rubrics) marking the responses encoded on the KoboCollect application installed on handheld devices.

PSYCHOMETRIC PROPERTIES

This section describes each PS subskill and its contributing items, and the overarching construct of PS. The data demonstrate that most items are similarly patterned from the perspective of gender (no differences), age, and education (increasing proficiency).

For each subskill, description about distribution of items and their values is provided, followed by information that shows how each item contributes to its hypothesised scale. All items contribute appropriately to their subskill scales.

Subskill: Recognizing the Problem

This subskill consists of three items: PS1b, PS3b, and PS4b. *This subskill targets an individual's ability to explore and analyse a scenario to identify whether it constitutes a problem, that is, whether there is a likelihood of a non-positive situation or outcome that requires a resolution.*

Adolescents' responses across four performance levels as defined by the coding rubrics are illustrated in Table 6. The distributions are shown by gender, age, and education status. Responses at performance level Beginning are typically null responses, that is, responses that are not related to the task or to the specific item.

Table 6: Recognizing the Problem – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item PS1b					
Gender	Male	16.4	19.4	53.4	10.9
	Female	19.0	17.3	52.7	10.9
Age	13-14	21.0	19.6	50.8	8.6
	15-17	14.5	17.1	55.3	13.1
Education level	Primary	20.6	20.4	51.0	8.1
	Secondary	9.3	13.5	59.5	17.7
Item PS1b					
Gender	Male	14.6	29.3	47.0	9.0
	Female	15.6	27.9	47.3	9.2
Age	13-14	18.3	30.2	44.1	7.4
	15-17	12.0	27.1	50.1	10.9
Education level	Primary	17.7	30.9	44.6	6.8
	Secondary	7.3	23.5	54.4	14.9
Item PS4b					
Gender	Male	14.0	29.9	49.3	6.8
	Female	15.4	29.7	48.4	6.5
Age	13-14	17.3	30.8	46.5	5.4
	15-17	12.2	28.8	51.2	7.9
Education level	Primary	16.8	31.6	46.6	5.0
	Secondary	8.2	26.0	55.2	10.6

For all three items, similar patterns in the performance of males and females can be observed. Most male and female adolescents achieved performance Consolidating, described as able to recognise a key feature of a situation that identifies it as problematic. Also, there is a pattern of the performance levels increasing as age and education levels of the adolescents also increase.

Subskill: Information Gathering

This subskill consists of three items: PS1c, PS3c, PS4c. *This subskill targets an individual's ability to think logically about what might have caused or contributed to a problem, and what therefore needs to be known in order to solve the problem.*

Table 7: Information Gathering – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item PS1c					
Gender	Male	33.2	21.2	39.9	5.7
	Female	36.5	20.2	37.7	5.6
Age	13–14	39.1	21.2	35.4	4.3
	15–17	30.7	20.2	42.1	7.0
Education level	Primary	38.8	22.0	35.2	4.0
	Secondary	24.5	17.9	48.0	9.7
Item PS3c					
Gender	Male	32.0	22.7	38.9	6.5
	Female	33.2	22.0	38.2	6.5
Age	13–14	37.2	22.9	34.6	5.4
	15–17	28.0	21.9	42.5	7.6
Education level	Primary	37.1	23.5	34.5	4.9
	Secondary	20.5	20.0	49.0	10.5
Item PS4c					
Gender	Male	26.5	17.9	48.6	7.0
	Female	27.3	16.7	48.7	7.2
Age	13–14	31.4	19.1	43.7	5.8
	15–17	22.5	15.5	53.5	8.5
Education level	Primary	30.8	19.6	44.1	5.5
	Secondary	15.7	12.3	60.9	11.2

For all three items, similar patterns in the performance of males and females can be seen. Most adolescents of both genders achieved performance level Consolidating, described as *able to identify an aspect or set of factors that, if known, might help to solve the problem*. For both age and education status, there is a pattern of performance levels increasing as age and education status of adolescents also increase.

Subskill: Exploring Solutions

This subskill consists of three items: PS1d, PS3d, and PS4d. This subskill targets an individual's ability to link their knowledge of the problem with possible actions or solutions.

Table 8: Exploring Solutions – Item Responses by Gender, age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item PS1d					
Gender	Male	27.3	14.4	44.8	13.4
	Female	29.4	13.5	43.5	13.7
Age	13–14	32.2	13.6	42.7	11.6
	15–17	24.6	14.4	45.6	15.5
Education level	Primary	32.1	14.0	43.0	10.9
	Secondary	18.1	13.6	47.8	20.5
Item PS3d					
Gender	Male	32.6	20.0	37.2	10.3
	Female	33.3	18.5	37.5	10.7
Age	13–14	37.1	18.2	35.6	9.2
	15–17	28.8	20.2	39.1	11.8
Education level	Primary	37.6	18.6	35.6	8.3
	Secondary	21.0	20.8	42.0	16.2
Item PS4d					
Gender	Male	33.8	14.3	42.6	9.3
	Female	18.2	12.5	51.4	17.9
Age	13–14	33.7	14.6	42.2	9.6
	15–17	25.6	13.1	47.4	13.8
Education level	Primary	30.8	19.6	44.1	5.5
	Secondary	15.7	12.3	60.9	11.2

For all three items, similar patterns in the performance of males and females can be observed.

Most adolescents achieved performance level Consolidating, which is described as *able to identify one main approach to solving the problem*. For both age and education status, there is a pattern of performance levels increasing as age and education status of adolescents also increase.

Subskill: Selecting the Solution

This subskill consists of three items: PS1e, PS3e, and PS4e. This subskill targets an individual's ability to evaluate multiple possible solutions to a problem.

Table 9: Selecting Solutions – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item PS1e					
Gender	Male	50.7	9.7	22.0	17.7
	Female	52.0	8.8	21.3	17.9
Age	13-14	55.0	9.2	20.6	15.2
	15-17	47.8	9.2	22.7	20.3
Education Status	Primary	55.3	9.5	20.7	14.5
	Secondary	40.6	8.9	24.0	26.5
Item PS3e					
Gender	Male	59.6	7.9	19.3	13.1
	Female	59.4	7.4	19.3	13.9
Age	13-14	62.7	7.5	18.1	11.7
	15-17	56.4	7.8	20.5	15.3
Education Status	Primary	32.1	14.0	43.0	10.9
	Secondary	18.1	13.6	47.8	20.5
Item PS4e					
Gender	Male	52.8	9.9	21.3	15.9
	Female	52.8	9.7	20.8	16.6
Age	13-14	57.5	9.6	19.5	13.4
	15-17	48.2	10.1	22.7	19.1
Education Status	Primary	32.1	14.0	43.0	10.9
	Secondary	18.1	13.6	47.8	20.5

For all three items, similar patterns in the performance of males and females can be observed. Most adolescents scored at Beginning, described as *unable to suggest any solution with justification*. For both age and education, there is a pattern of performance levels increasing as age and education levels of adolescents also increase.

Reliability Analysis of the Problem-Solving Subskills Scales

Each of the four subskill scales draws on items that contribute well to the subskills. In addition, review of how the items contribute to the overarching PS construct indicates high homogeneity of content, which is supported by the alpha reliability coefficients (Table 10).

Table 10: Summary of Reliability Coefficient of the Problem-Solving Constructs

	# items	Alpha
PS Recognition of problem	3	.7156
PS Information gathering	3	.7360
PS Exploring solutions	3	.7493
PS Selecting solutions	3	.7620
PS Overall	12	.9070

Psychometric Properties: The Item Fit Statistics

This section presents information on the item fit statistics generated using the Rasch partial credit model. Fit statistics are used to investigate how each data point (both at the item level and the person level) conforms to the expectations of the model. Misfitting items or persons can distort measurement and may suggest that some items do not align with the construct being measured, or that some persons did not engage with the items as expected. Examination of item fit and spread provide evidence for construct and criterion validity.

Table 11: Item Fit Statistics for Problem Solving

Item	Unweighted Fit			Weighted Fit		
	Fit value	t-stat	p-value	Fit value	t-stat	p-value
PS1b	1.10	12.35	0.000	1.10	14.82	0.000
PS1c	1.04	6.08	0.000	1.06	8.36	0.000
PS1d	1.04	5.35	0.000	1.05	7.03	0.000
PS1e	1.11	11.41	0.000	1.10	15.99	0.000
PS3b	0.98	-2.53	0.011	1.01	0.95	0.341
PS3c	0.98	-2.43	0.015	1.01	0.72	0.472
PS3d	0.92	-9.67	0.000	0.95	-8.23	0.000
PS3e	0.87	-15.48	0.000	0.91	-15.47	0.000
PS4b	0.87	-14.62	0.000	0.91	-14.30	0.000
PS4c	1.00	0.28	0.777	1.05	7.86	0.000
PS4d	0.88	-6.31	0.000	0.98	-2.78	0.005
PS4e	0.91	-5.44	0.000	1.00	0.56	0.579

All items hypothesized to measure problem solving demonstrated 'good fit'. This means that the responses to items varied in expected ways. At a statistical level, the weighted mean-square values were all between 0.7 to 1.3 (Wu et al., 2016).

The Rasch model requires that items' parameters remain fixed irrespective of the persons being measured; and vice versa, persons' parameters remain the same irrespective of items used to measure. This property of the Rasch model allows for development of common metrics and criterion-referenced interpretation of individual performance. Fit of data to a model is required to justify the use of Rasch analysis to develop performance measures and to compare individuals' performance across different subgroups within a population.

Problem Solving: Differential Item Functioning

Use of assessment tools across countries or cultures raises issues of validity of comparison between groups. Such issues may reside in matters of language, societal norms, religion, ethnicity, as well as age and gender. Test developers make efforts to design assessments in ways that will avoid differential bias among groups. Notwithstanding, it is also necessary to check whether such bias may have occurred after the fact. The results and information from Differential Item Functioning (DIF) analysis provide a rich source of information for exploring the possibility of bias of measurements across groups.

Analyses were conducted across the four jurisdictions to provide insights into whether items functioned differently or similarly across them. Detection of DIF was done through visual inspection of the results from scatterplots using item thresholds derived from the Rasch model. Item thresholds for each of the study jurisdictions were placed on the Y-axis, and the regional item thresholds – all four jurisdictions together—were placed on the X-axis. In addition, scatterplots for each of the study jurisdictions were contrasted with each other.

Overall, there is negligible DIF in problem solving across the four jurisdictions. In exploring the slight differences that do occur, it is clear that they are primarily due to group difference in performance rather than bias. It can be concluded that problem-solving items pattern very similarly across all four jurisdictions. Figure 4 provides an example that shows most differences obtained for a jurisdiction versus the region.

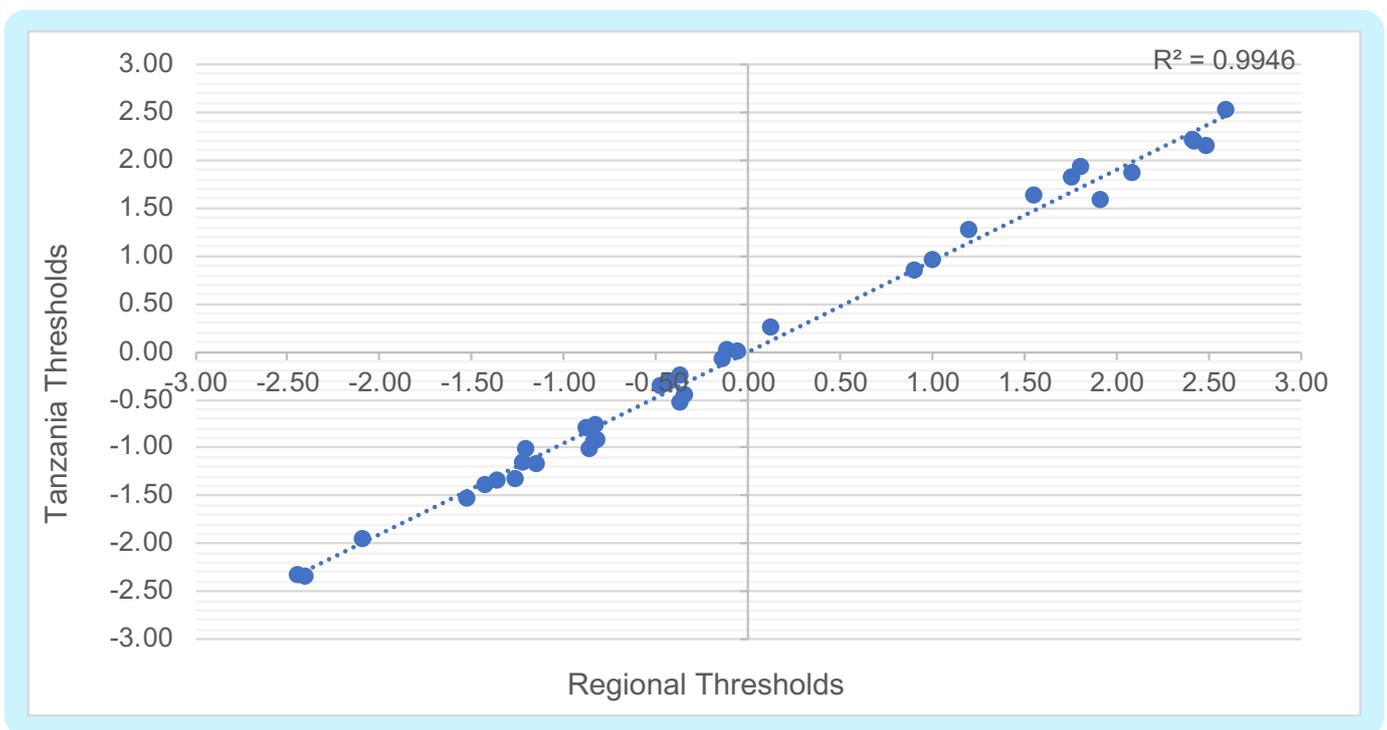


Figure 4: Scatterplot of Problem-Solving Item Thresholds: Tanzania versus the Region

Problem Solving: Item Spread and Coding of Responses

In order to compare whether the three tasks were differentially difficult for the adolescents, and whether some subskills are more difficult to demonstrate than others, the Rasch partial credit model was used. Figure 5 illustrates how the tasks and items were experienced by the adolescents. The person-ability map based on the Rasch model provides a view of how well items are spread out to define increasing proficiencies, and whether the items are separated enough to measure the respondents' abilities. Rasch item difficulty is not dependent on sample. Rasch item difficulty is defined in terms of the abilities needed to obtain a 50 percent chance of getting an item correct (Wu & Adams, 2007) and allows for the placement of items and persons on the same scale. The actual positioning of an item on a scale in terms of its difficulty is defined by the person ability for which the probability of a correct answer to the item equals 0.5. Naturally, therefore, the higher the person's ability, the greater the probability of correctly answering an item.

Figure 5 shows that the coding of responses from low to higher performance levels accurately represents increasing proficiency. This finding validates the approach to item design which allowed for clearly identifiable differences in responses and their coding. For example, responding to Task 3's b item (*recognising the problem*) is the least difficult, calling for the lowest level of proficiency. This is denoted by the location of the Cat1 identifier aligned with PS3b at the bottom of Figure 5 (refer to the notes to Figure 5). 'Cat1' denotes the lowest level of response for an item, with Cat2 denoting the mid-level, and Cat3 denoting the highest level.

As can be seen from Figure 5, all Cat1 responses are located towards the bottom of the figure, all Cat2 somewhat higher, and all Cat3 towards the upper end of the figure. This clear separation of response codes across the items clearly demonstrates that the coding rubrics indeed captured similar degrees of discrimination across proficiencies for most items.

Problem Solving: Relative Difficulty of Subskills

Figure 5 illustrates the degree to which the four subskills are similarly easy or difficult. Items contributing to each subskill are clustered together in the figure: *recognizing the problem* (items PS1b, PS3b, and PS4b), *information gathering* (items PS1C, PS3c, and PS4C), *exploring alternative solutions* (items PS1d, PS3d, and PS4d), and *selecting the solution* (items PS1e, Pse3, and PS4e). The subskill '*recognising the problem*' includes the widest range of competencies while the subskill '*exploring solutions*' demonstrates the smallest range of competencies.

Problem Solving: Overall Distribution of Items across Persons

An ideal test would be characterised by items distributed right across the possible range of persons' abilities. Such an instance would allow for optimal differentiation of one person's abilities from another. This is somewhat but not totally the case for this set of items. Regardless, there is sufficient delineation between each coding level to justify the attribution of descriptive scoring statements to the four proficiency categories of PS. The unidimensional solution that treats all items as contributing only to the overarching PS construct is shown in Figure 5.

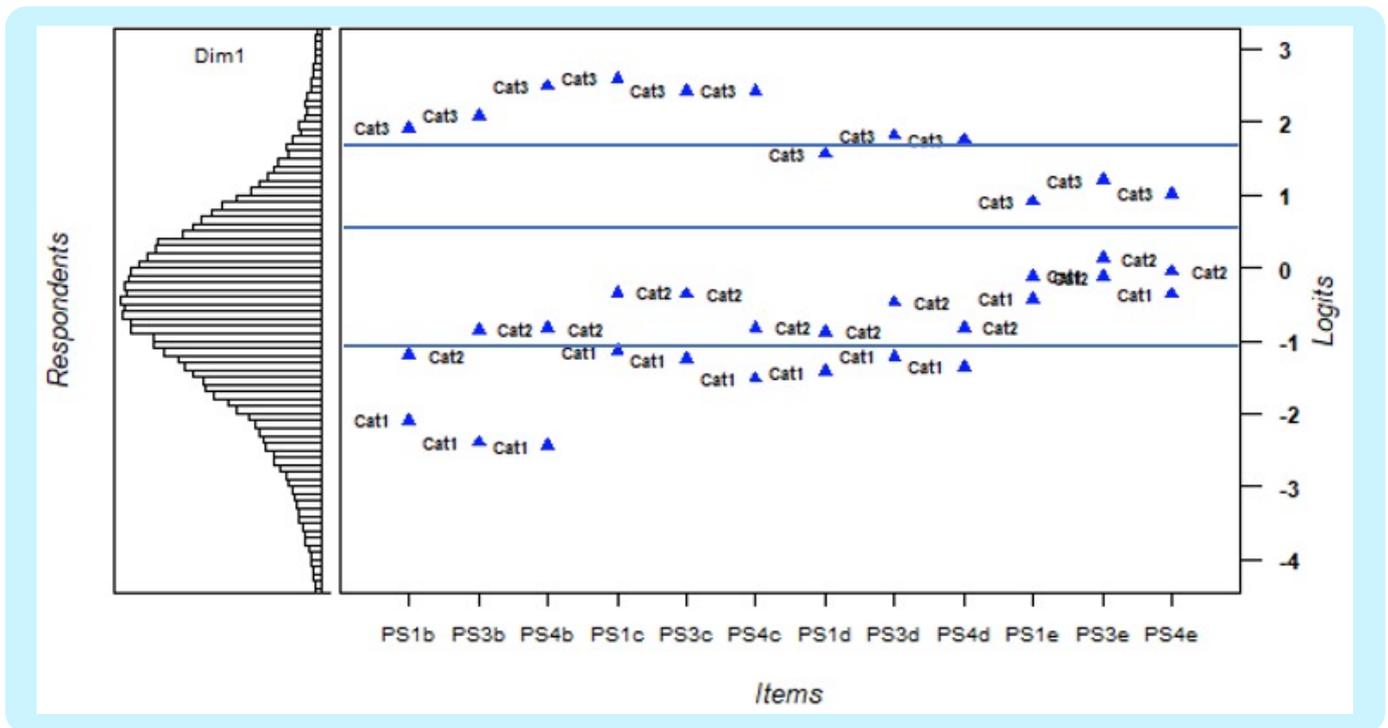


Figure 5: Person-Ability Map for Problem Solving (Unidimensional Scale)

NOTE

Descriptive categories of performance were determined for the overarching problem-solving groups based on analyses of items in terms of their logit scores and locations relative to each other: (Lowest thru -1.1 logit = Emerging); (-1.09 thru 0.50 logit = Consolidating); (0.51 thru 1.6 logit = Proficient); (1.6001 logit thru Highest = Proficient).

PROBLEM-SOLVING PROFICIENCIES OF ADOLESCENTS

Descriptive Proficiency Statements for Problem Solving

The first step in checking for meaningfulness of the scales and their proficiency levels is to construct qualitative descriptors for the range of proficiencies based on the adolescent responses, and check these against the skills required to respond to the items. This is done based on the person-ability map, which places adolescents' abilities and items' difficulty parameters on the same scale. The descriptive proficiency statements derived for the PS construct are shown in Table 12.

Table 12: Descriptive Proficiency Statements for Problem Solving

Construct	Beginning Adolescent is...	Emerging Adolescent is...	Consolidating Adolescent is...	Proficient Adolescent is...
Problem Solving	Struggling to recognise a problem or its nature and therefore unable to identify possible solutions	Able to recognise existence of a problem from one perspective, and act on that to identify a possible solution	Able to recognise existence of a problem from one perspective; Able to identify a main approach to solving the problem and can justify it	Able to recognise existence of a problem from multiple perspectives, understanding that there may be multiple solutions to evaluate and select from

Distribution of Problem-Solving Results

This section presents information about how problem-solving skills vary across factors that characterise the adolescents. The information is organised according to the descriptive statements presented in Table 12.

A reasonably large proportion of adolescents (32.9%) struggled to recognize a problem and identify possible solutions to it (Emerging), while nearly half (49.1%) of the adolescents were able to recognise the existence of a problem from one perspective and act on that in order to identify a possible solution (Consolidating). Relatively few were able to justify solutions or identify multiple approaches to solving a problem.

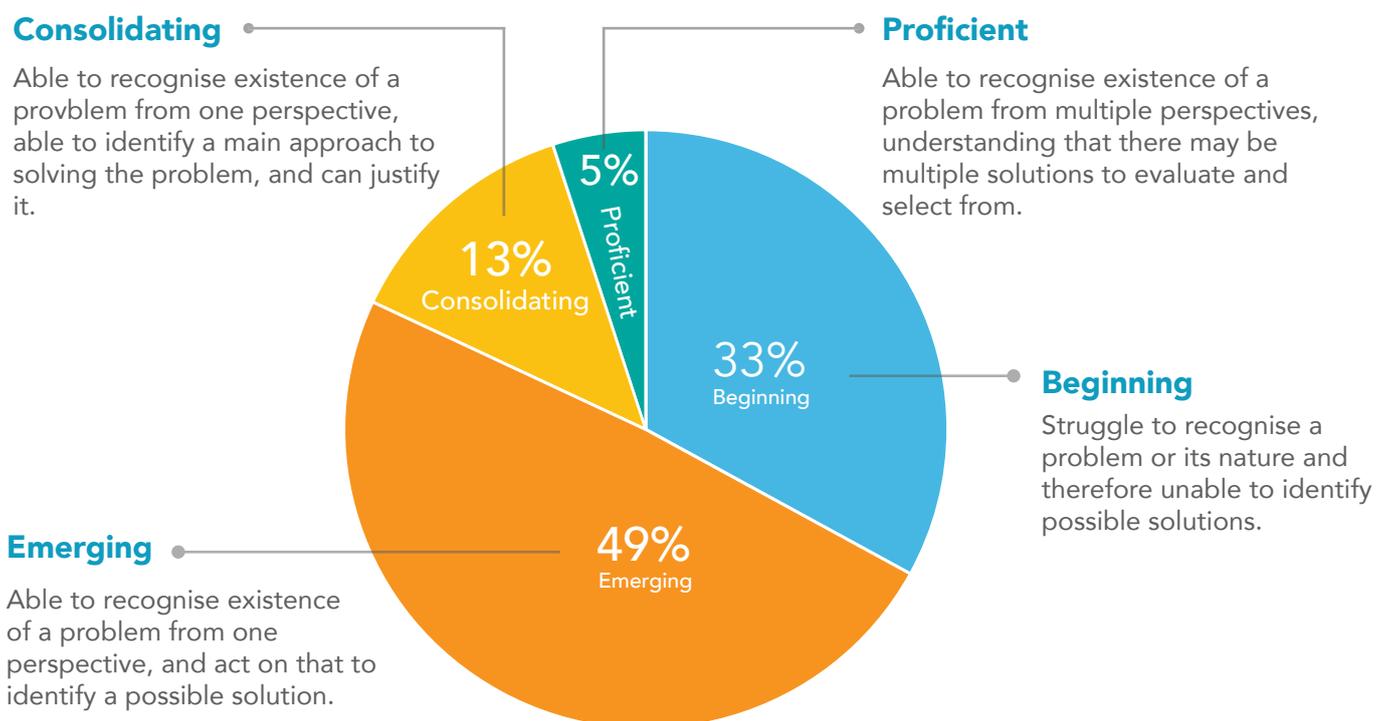


Figure 6: Problem-Solving Proficiency Levels

Distributions by Jurisdictions

The distributions of adolescents within each of the four jurisdictions across the proficiency levels are shown in Figure 7. As can be seen, most adolescents in all four jurisdictions perform within the Emerging level, and the least perform within the Proficient level, the highest functioning level. There is a slight skew in the distribution of the Zanzibar adolescents, with fewer than expected at the lowest level, and more than expected at the higher levels.

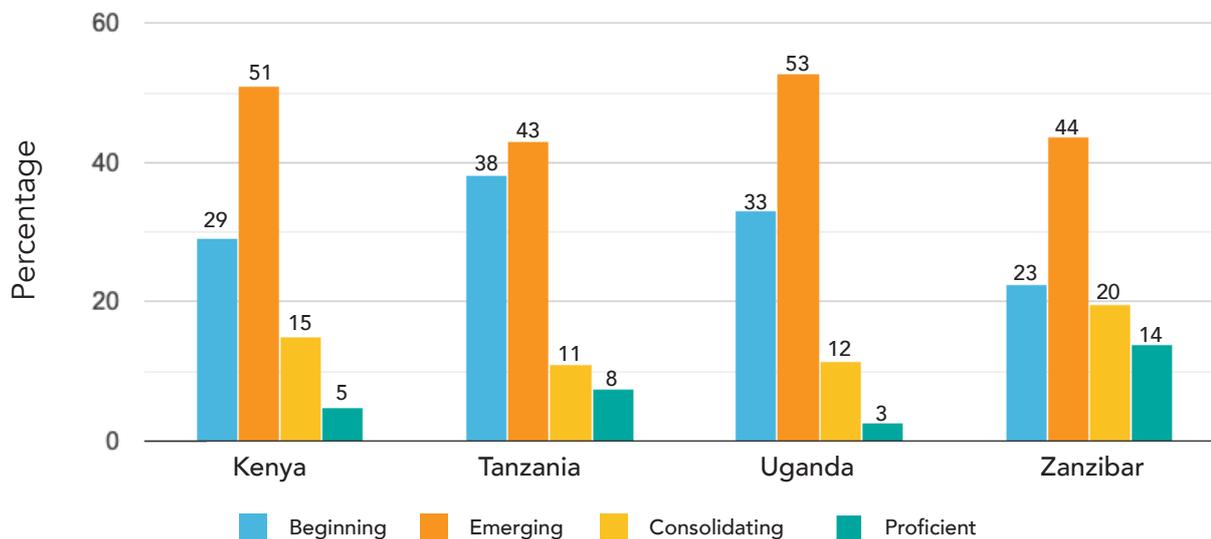


Figure 7: Problem-Solving Proficiency Levels by Jurisdiction

Distributions by Gender, Disability, Age, and Education

Gender had no impact on problem solving—in other words, males and females performed similarly to each other. Similarly, there are no associations between disability status of the adolescents and problem solving.

Table 13: Problem-Solving Proficiency Levels of Adolescents by Selected Characteristics

Adolescents' Characteristics		Problem-solving proficiency levels			
		Beginning	Emerging	Consolidating	Proficient
		% of adolescents (n=45,442)			
Gender	Male	32.6	49.3	12.8	5.3
	Female	33.2	48.8	13.1	5.0
Age	13-14	38.7	46.5	11.2	3.7
	15-17	27.3	51.5	14.7	6.5
Education Status	Primary	38.6	47.3	10.7	3.4
	Secondary	17.5	54.4	18.6	9.4
Disability status	No form of disability	32.9	48.7	13.2	5.2
	At least 1 form of disability	32.6	51.6	11.3	4.5

Age has an influence on the demonstrated proficiencies of adolescents. Older adolescents demonstrate higher proficiencies compared to younger adolescents. For instance, 6.5% of the adolescents from 15 to 17 years old compared to 3.7% of the adolescents aged 13 to 14 years, are able to recognise the existence of a problem from multiple perspectives, understanding that there may be multiple solutions to evaluate and select from (Proficient). At Beginning level, 27.3% of adolescents between 15 and 17 years of age, compared to 38.7% of the adolescents aged 13 to 14 years, struggle to recognise a problem or its nature and are therefore unable to identify possible solutions.

Education is also associated with increasing proficiencies. Those adolescents who are more educated demonstrated higher proficiencies than did less educated adolescents. For instance, 9.4% of the adolescents who have reached the secondary level of education compared to only 3.4% of those who have reached the primary level of education, are able to recognise the existence of a problem from multiple perspectives, understanding that there may be multiple solutions to evaluate and select from (Proficient). On Emerging, 17.5% of the adolescents with a secondary level of education compared to 38.6% of the adolescents with a primary level of education struggle to recognise a problem or its nature and are therefore unable to identify possible solutions.

Association between Problem Solving and Basic Literacy

The distribution of the adolescents' PS proficiencies by their basic literacy proficiencies presents some significant associations (Figure 8). Adolescents who are 'fluent' readers tended to demonstrate higher PS proficiencies compared to those who are 'not fluent' readers. For instance, 20.6% of the adolescents who are fluent readers, compared to 39.3% of those who are non-fluent readers, struggle to recognise a problem or its nature and are therefore unable to identify possible solutions (Beginning).

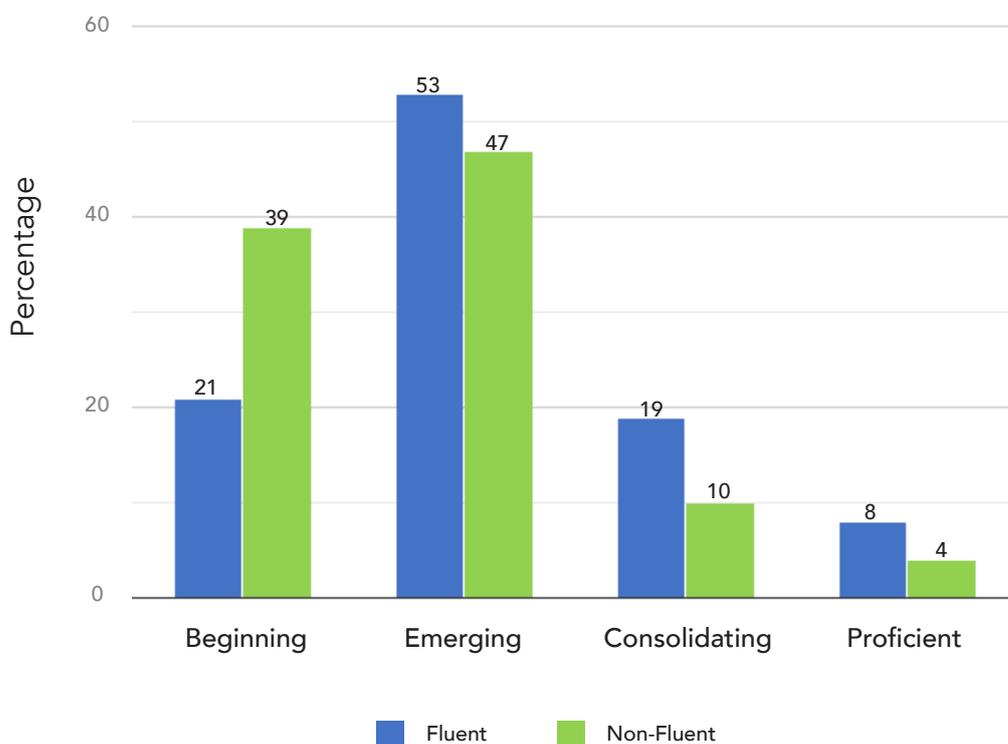


Figure 8: Problem-Solving Proficiencies of Adolescents by Fluency in Basic Literacy

Association between Problem Solving and Digital Literacy

The distribution of adolescents' PS proficiencies by their digital literacy presents some significant associations (Figure 9). Adolescents who are competent in digital literacy tend to demonstrate higher PS proficiencies compared to their counterparts. For instance, 18.4% of the adolescents who are able to use technology with ease, compared to 44.3% of the adolescents who are not able to use technology, struggle to recognise a problem or its nature and are therefore unable to identify possible solutions (Beginning).

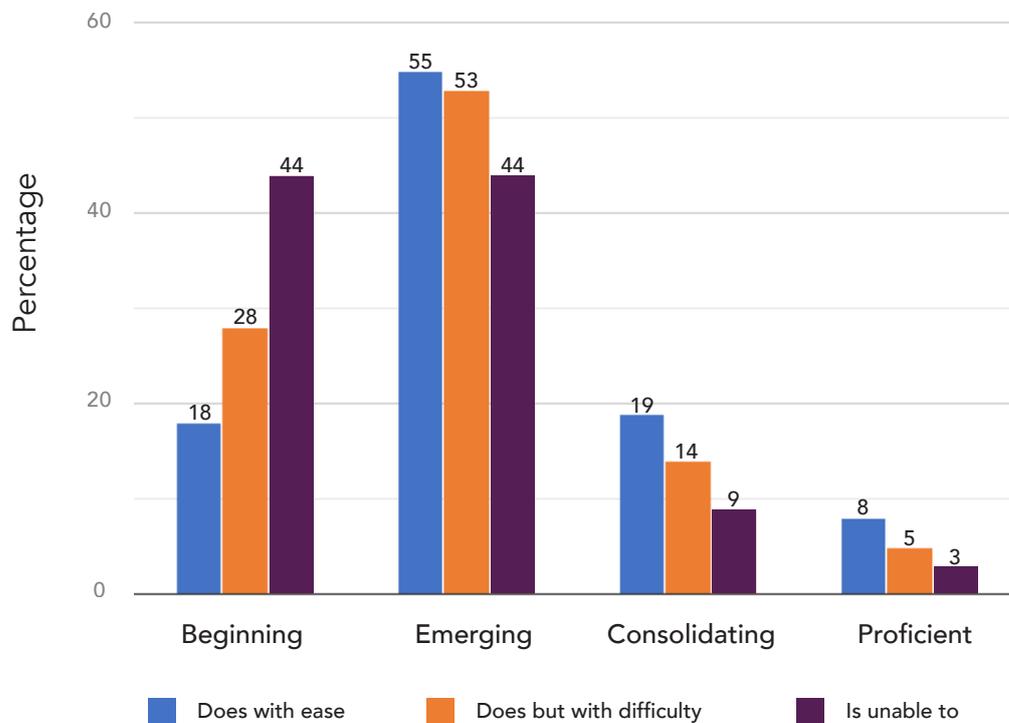


Figure 9: Problem-Solving Proficiencies of Adolescents by Digital Literacy Compet



Summary Of Problem Solving

The Measurement

The problem-solving tool comprises three tasks, each with a subset of four items. Each task consists of a brief description of a situation, using four items, each of which targets a different aspect of an adolescent's problem-solving proficiency. These subskills are *recognizing the problem*, *information gathering*, *exploring alternative solutions*, and *selecting the solution*.

All scales demonstrate high reliability, and each contributes robustly to the overarching skill of problem solving. Given the strength of the unidimensional model, reporting results at the overarching construct is a reasonable approach.

The Results

The problem-solving tool functions well in differentiating between adolescents in terms of their proficiencies. The results do not tell us the grade level at which these adolescents

are functioning, since there are no current 'standards' in the participating jurisdictions that have set these. The results provide information across the subskills, which could be used to begin the design of instructional programs to improve performance in each of these subskills. For example, *recognition of the problem* is the easiest subskill for this group of adolescents, so providing additional experiences of how to identify problems would build on the current 'zone of proximal development' (Vygotsky, 1968) and provide a basis upon which to move steadily to the other problem-solving subskills of gathering relevant information and exploring and selecting solutions. The final subskill of *selecting solutions* is both identified as the most difficult from these results but is also subject to some measurement issues associated with how the tasks were structured and how the items were scored. These issues can be addressed in future development of additional tasks.

3.3 Self-Awareness

This section describes that part of the ALiVE tool ('the tool') used to gather data on the self-awareness (SA) proficiencies of the adolescents, and describes those proficiencies.

The SA assessment comprises five tasks with a set of 12 items. Each task includes a brief description of a situation, with items targeting different aspects of an adolescent's SA proficiency. The five tasks follow slightly different patterns. The items assess the adolescent's SA through two of its subskills: *self-management*—managing emotions and stress; and *perspective taking*—understanding views and actions of others, adjusting to others' views and actions, and recognizing one's identity and where one fits into one's family, society, and community. The tasks are numbered 1, 3, 4, 6, and 7 (a numbering convention derived from the development of the SA tool, which included 7 tasks in field testing). The final tool provides 12 data points from adolescents' completion of all five tasks (Table 14).

Table 14: Tasks and Items Contributing to the Self-Awareness Scale and Subskills

Constructs		Items	#
Self-awareness		SA1b, SA1e, SA1d, SA3a, SA3c, SA4b SA4c, SA6b, SA6c, SA7b, SA7c, SA7d	12
Subskills	Self-management	SA1d, SA4b, SA6b, SA6c, SA7b, SA7c	6
	Perspective taking	SA1b, SA1e, SA3a, SA3c, SA4c, SA7d	6

For the assessment, each task is read out loud to the adolescent. Then the researchers ask questions, the answers to which provide item-level data. The coding of responses is enacted in real time, with test administrators, being familiar with the coding rubrics, marking the responses encoded on the KoboCollect application installed on handheld devices.

PSYCHOMETRIC PROPERTIES

The data demonstrate that most items are similarly patterned from the perspective of gender (no differences), and age and education (increasing proficiency). The items hypothesised to inform each of the two subskills or dimensions—*self-management* and *perspective taking*—contribute to their scales in the anticipated way.

For each subskill, description about distribution of items and their values is provided, followed by information that shows how each item contributes to its hypothesised subskill. All items contribute appropriately to their subskill scales.

Subskill: Self-Management

This subskill consists of six items: SA1d, SA4b, SA6b, SA6c, SA7b, and SA7c. *This subskill targets an individual's ability to recognize and express emotions, to assess self and reflect, and to manage emotions.*

Adolescents' responses as defined by the coding rubrics across the performance levels are illustrated. The distributions are shown by gender, age, and education status. Responses at the lowest performance level are typically null responses, that is, responses that are not related to the task or to the specific item.

Table 15: Self-Management – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item SA1d					
Gender	Male	21.4	28.4	27.1	23.1
	Female	21.1	30.8	25.2	22.9
Age	13–14	24.0	31.1	24.7	20.2
	15–17	18.6	28.2	27.5	25.8
Education level	Primary	23.3	31.3	25.2	20.3
	Secondary	14.5	25.5	29.6	30.4
Item SA4b					
Gender	Male	18.6	31.3	25.6	24.5
	Female	18.3	32.4	24.7	24.6
Age	13–14	20.8	33.0	23.7	22.5
	15–17	16.2	30.8	26.5	26.6
Education level	Primary	20.2	33.4	24.6	21.8
	Secondary	12.4	27.9	27.1	32.7
Item SA6b					
Gender	Male	20.2	28.2	27.2	24.5
	Female	20.8	29.3	27.0	22.9
Age	13–14	23.7	29.6	25.3	21.4
	15–17	17.4	27.9	28.8	25.9
Education level	Primary	22.5	30.9	26.3	20.4
	Secondary	14.2	23.2	29.8	32.9
Item SA6c					
Gender	Male	21.7	26.5	23.8	28.1
	Female	22.2	25.9	24.0	27.9
Age	13–14	25.2	27.0	22.7	25.1
	15–17	18.8	25.3	25.0	30.9
Education level	Primary	24.5	27.8	23.5	24.2
	Secondary	14.6	21.8	25.1	38.5
Item SA7b					
Gender	Male	13.8	37.8	32.4	16.0
	Female	13.9	39.3	31.0	15.8
Age	13–14	16.0	40.1	29.5	14.5
	15–17	11.8	37.1	33.9	17.3
Education level	Primary	15.2	40.5	30.3	14.0
	Secondary	9.2	33.1	36.2	21.5
Item SA7c					
Gender	Male	23.5	20.7	36.0	19.9
	Female	24.0	21.3	36.0	18.8
Age	13–14	26.6	21.5	33.9	18.0
	15–17	21.0	20.4	38.1	20.6
Education level	Primary	25.8	21.9	34.5	17.8
	Secondary	17.7	18.2	40.1	24.1

For all six items, similar patterns in the achievement of males and females can be observed. For most items in this subskill, most adolescents reached performance Score 1, described as unable to regulate negative emotions or responses. For all items there is a pattern of responses of older adolescents moving from lower to higher performance scores. Similarly, there is a pattern of responses of more educated adolescents moving from lower to higher performance levels.

Subskill: Perspective Taking

This subskill consists of six items: SA1b, SA1e, SA3a, SA3c, SA4c, and SA7d. *This subskill targets an individual's ability to understand why people behave the way they do towards him or her, to accept feedback, and to recognise his or her impact on and place in family, society, and community.*

Table 16: Perspective Taking – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=45,442)			
Item SA1b					
Gender	Male	22.4	23.9	38.9	14.8
	Female	22.4	22.0	40.2	15.4
Age	13–14	26.0	23.8	38.1	12.1
	15–17	18.8	22.0	41.0	18.1
Education level	Primary	25.0	24.9	38.4	11.7
	Secondary	13.8	17.3	44.8	24.1
Item SA1e					
Gender	Male	40.8	26.8	20.2	12.3
	Female	41.9	25.8	20.3	12.1
Age	13–14	45.5	26.1	18.7	9.7
	15–17	37.2	26.5	21.7	14.6
Education level	Primary	44.7	26.8	19.0	9.5
	Secondary	32.6	24.4	23.8	19.2
Item SA3a					
Gender	Male	19.5	36.5	21.2	22.7
	Female	17.8	38.8	21.5	21.9
Age	13–14	21.3	39.7	19.8	19.2
	15–17	16.1	35.7	22.9	25.3
Education level	Primary	20.8	39.5	20.2	19.6
	Secondary	11.4	34.3	24.7	29.7
Item SA3c					
Gender	Male	41.8	42.5	11.5	4.3
	Female	43.3	41.0	11.3	4.4
Age	13–14	47.1	40.0	9.5	3.4
	15–17	38.0	43.5	13.3	5.2
Education level	Primary	45.8	41.7	9.4	3.2
	Secondary	33.5	42.9	16.5	7.1
Item SA4c					
Gender	Male	32.4	48.8	14.8	4.1
	Female	33.2	47.8	14.8	4.2
Age	13–14	36.7	46.7	13.1	3.5
	15–17	28.9	49.8	16.5	4.8
Education level	Primary	36.7	47.4	12.8	3.2
	Secondary	22.0	51.7	19.7	6.6
Item SA7d					
Gender	Male	33.2	46.1	16.1	4.6
	Female	33.9	45.4	16.3	4.4
Age	13–14	37.6	44.4	14.4	3.6
	15–17	29.6	47.1	18.0	5.4
Education level	Primary	37.5	45.3	13.7	3.4
	Secondary	22.7	48.1	22.0	7.2

For all six items, similar patterns in the performance levels of males and females can be seen. In terms of age, there is a pattern of responses of older adolescents moving from lower to higher performance levels. Similarly for education status, there is a pattern of responses of more educated adolescents moving from lower to higher performance levels. Most adolescents scored in the Consolidating range.

Reliability Analysis of the Self-Awareness Scales

Each of the two subskill scales draws on items that contribute well to the subskills. Review of how the items contribute to the overarching SA construct indicates high homogeneity of content, supported by the alpha reliability coefficients (Table 17).

Table 17: Summary of Reliability Indices for Self-Awareness Constructs

	# items	Alpha
SA Self-management	6	.7535
SA Perspective taking	6	.7375
SA Overall	12	.8374

Psychometric Properties: The Item Fit Statistics

This section presents information on the item fit statistics estimated based on the Rasch partial credit model. These fit statistics and spread provide evidence for construct and criterion validity.

Table 18: Item Fit Statistics for Self-Awareness

Item	Unweighted Fit			Weighted Fit		
	Fit value	t-stat	p-value	Fit value	t-stat	p-value
SA1b	0.99	-2.13	0.033	0.99	-1.85	0.065
SA1e	1.06	7.73	0.000	1.07	11.10	0.000
SA3a	1.05	7.89	0.000	1.04	7.08	0.000
SA3c	0.95	-7.40	0.000	0.97	-3.88	0.000
SA4c	0.96	-6.39	0.000	0.97	-4.31	0.000
SA7d	0.94	-8.61	0.000	0.96	-6.03	0.000
SA1d	1.01	1.79	0.074	1.01	1.76	0.079
SA4b	1.05	8.31	0.000	1.05	7.81	0.000
SA6b	1.02	2.57	0.010	1.02	3.10	0.002
SA6c	1.01	0.69	0.493	1.01	1.75	0.081
SA7b	1.00	0.59	0.553	1.00	-0.05	0.962
SA7c	1.01	1.65	0.099	1.02	2.65	0.008

All items hypothesized to measure self-awareness demonstrated 'good fit.' That is to say, the weighted mean-square values were all between 0.7 and 1.3.

Self-awareness: Differential Item Functioning

Overall, there is negligible DIF in SA across the four jurisdictions. In exploring the slight differences that do occur, it is clear that they are primarily due to group difference in performance rather than bias. It can therefore be concluded that items for SA pattern very similarly across all four jurisdictions. Figure 10 provides an example using the *self-management* subskill, which illustrates the greatest differences found from all SA subskill and overarching construct comparisons, between jurisdictions.

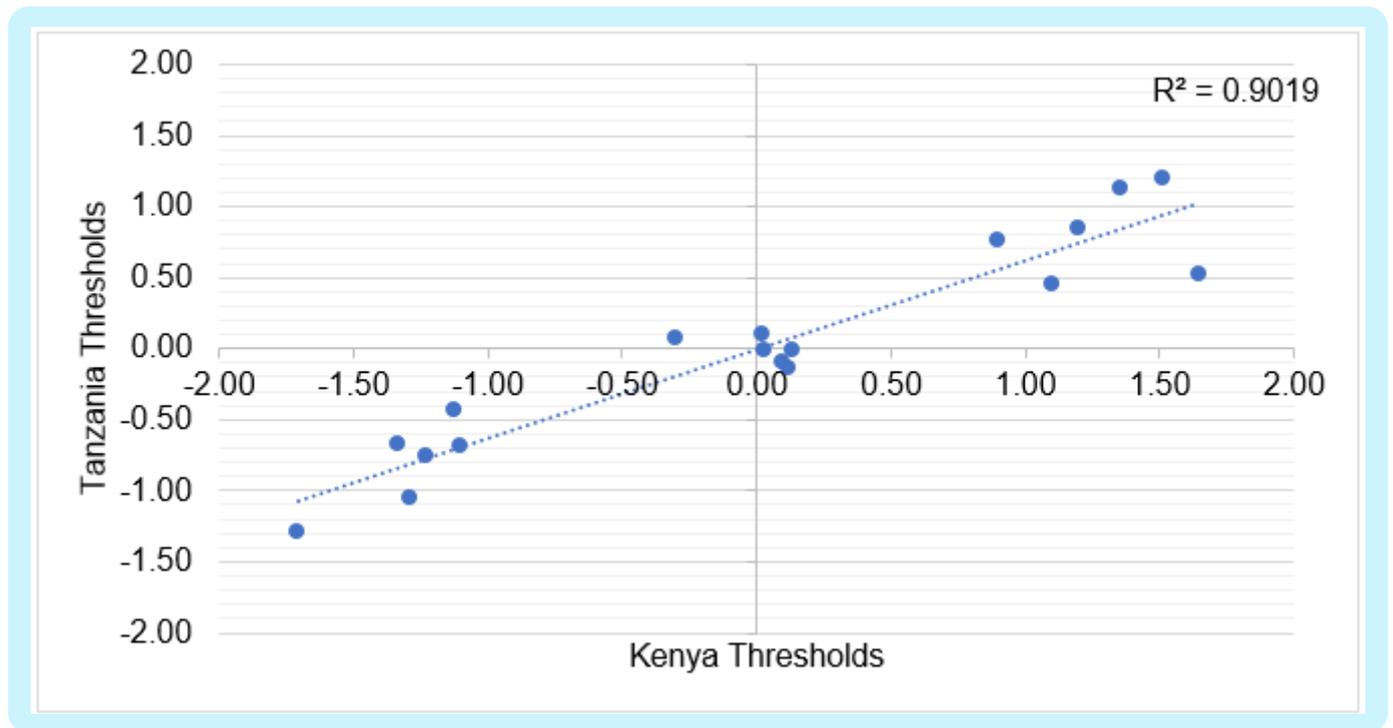


Figure 10: Scatterplot of Self-Management Item Thresholds: Tanzania Mainland versus Kenya

Self-Awareness: Item Spread and Coding of Responses

In order to evaluate how difficult the five tasks were for the adolescents, and whether one subskill is more difficult to demonstrate than the other, the Rasch partial credit model was used. Figure 11 illustrates how the five tasks and 12 items prompted adolescent responses. The person-ability map based on the Rasch model shows how the items are spread out to define increasing proficiencies.

Figure 11 shows that the coding of responses from low to higher levels accurately represents increasing proficiencies. In other words, Cat1 (the lowest level of coded response) items appear below Cat2, and thence below Cat3, which indicates that the underlying hypotheses about successively more difficult performance are confirmed by the data. This finding validates the approach to item design, which allowed researchers to detect clearly distinguishable behaviours.

Self-Awareness: Relative Difficulty of Subskills

In order to examine whether the two subskills are similarly easy or difficult, items contributing to each of these are examined. The *self-management items* (SA1d to SA7c) and perspective taking items (SA1b to SA7d), are shown on the right- and left-hand side, respectively, of the blue dot line in Figure 11. The subskill *perspective taking* appears more difficult to demonstrate than does self-management.

Self-Awareness: Overall Distribution of Items across Persons

The set of items taps into a wide range of proficiencies, with individual items well distributed throughout the response space. The coding levels are reasonably well separated, although the slightly different difficulty demand of the two subskills complicates distribution. This difference in information derived from the subskills, compared to the overarching construct, justifies the attribution of descriptive scoring statements for four categories of proficiency for each of the subskills, and three for the overarching SA construct. The unidimensional solution that treats all items as contributing only to the overarching SA construct is shown in Figure 11.

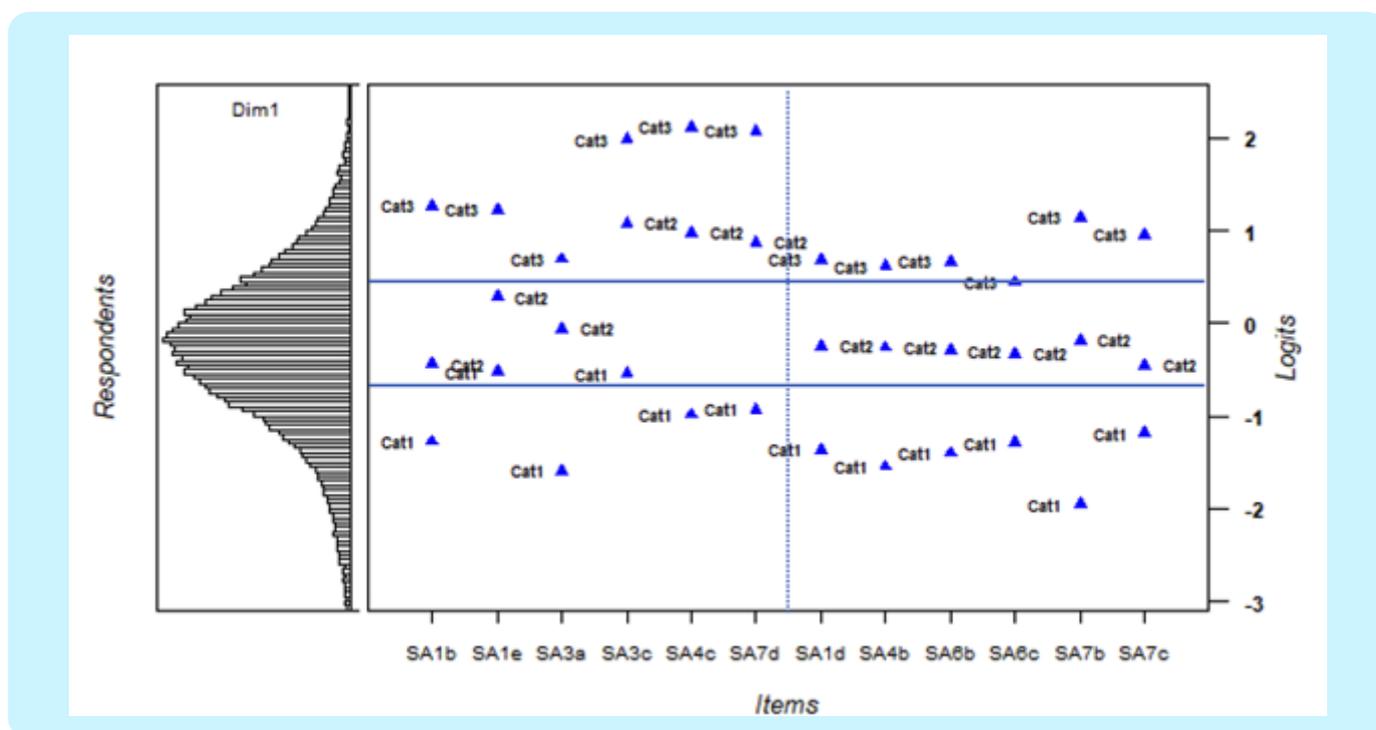


Figure 11: Person-Ability Map for Self-Awareness Scale (unidimensional scale)

Based on analyses of items in terms of their logit scores and locations relative to each other, descriptive categories of performance were determined as follows:

- Self-awareness: (Lowest thru -0.50 logit = Emerging) (-0.49 thru 0.60 logit = Consolidating) (0.601 thru Highest = Proficient).
- Self-management: (Lowest thru -0.50 logit = Emerging) -0.49 thru 0.60 logit = Consolidating) (0.61 thru Highest = Proficient).
- Perspective taking: (Lowest thru -0.80 logit = Emerging) (-0.79 thru 0.80 logit = Consolidating) (0.801 thru Highest = Proficient).

NOTE

Self-Awareness Proficiencies of Adolescents

Table 19 presents the descriptive proficiency statements for the overarching self-awareness scale as well as the two subskills, self-management and perspective taking. These descriptors are based on analysis of levels of quality of the responses as coded into category scores, and on how these are located in the person-map space (Figure 11).

Table 19: Descriptive Proficiency Statements for Self-Awareness

Construct	Beginning Adolescent is...	Emerging Adolescent is...	Consolidating Adolescent is...
Self-management: This subskill targets an individual's ability to recognize and express emotions, to assess self, to reflect, and to manage emotions.	Unable to regulate negative emotions or responses	Able to control self in a negative or stressful situation through repression of emotion or avoidance	Sufficiently self-aware and confident to respond adaptively even when directly confronted or attacked
Perspective taking: This subskill targets an individual's ability to understand why people behave the way they do towards him or her, to accept feedback, and to recognise his or her impact on and place in family, society, and community.	Aware of others' perspectives only in relation to oneself	Aware that others may be impacted by multiple factors	Aware that others act on the basis of multiple factors, both personal and community
Self-awareness	Unable to recognize and control one's emotions and unaware of how others might feel	Able to control one's emotions-driven reactions and has some insight into how others might see a situation	Able to regulate one's emotions and reactions, and aware of the multiple ways that others might perceive and react to situations

Distribution of Self-Awareness Results

Based on the descriptors presented in Figure 12, the assessed adolescents' distributions for the overarching SA construct and each of the subskills are presented. Overall, only 13.5% of the adolescents demonstrate the capacity to regulate their emotions across a range of situations and to perceive and acknowledge how others might perceive and react to these situations. Most (49.1%) of the adolescents can control their reactions to some degree and have some insight into the fact that others might see situations differently. More than a third (37.3%) of the adolescents seem to have little insight into how their emotions control their reactions and seem unaware of how others might feel in difficult situations.

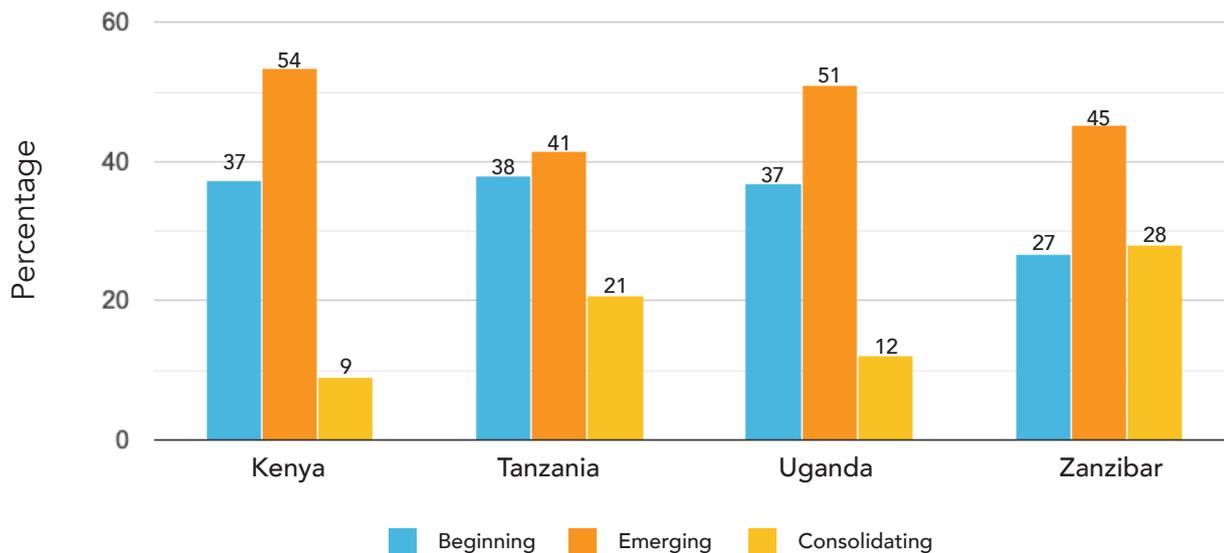


Figure 12: Self-Awareness Proficiency Levels by Jurisdiction

More information about adolescents' SA can be elicited from the subskills data. The two subskills, *self-management* and *perspective taking*, vary in terms of how difficult they are to demonstrate. In this population, adolescents are more able to control their reactions to difficult circumstances than they are able to recognise the impact of the same situations on others.

Self-Management Proficiency Levels

Overall, most (51%) of the adolescents were able to demonstrate self-control in a negative or stressful situation through repression of emotions, or through avoidance. They were less able to respond adaptively when presented with situations in which they might be directly confronted or attacked (Emerging). About 26% of the adolescents are unable to regulate negative emotions or responses (Beginning).

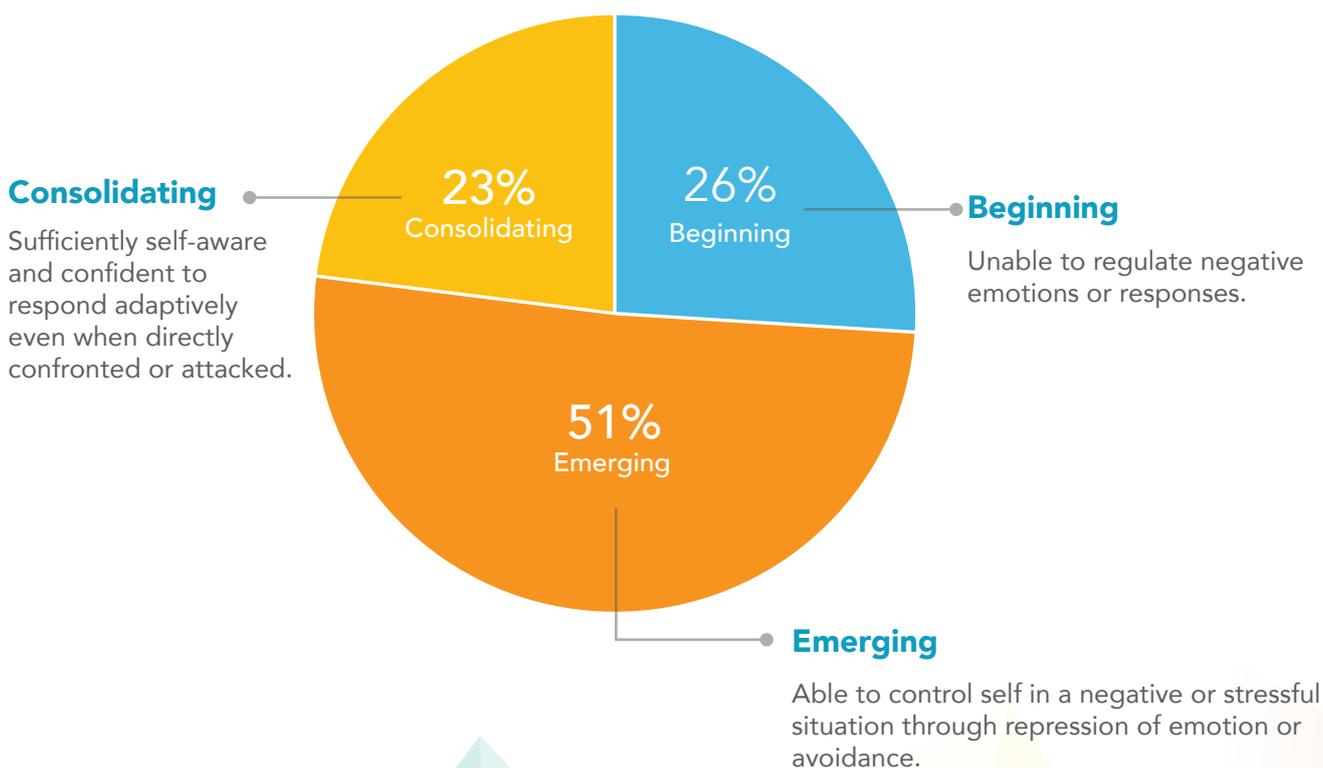


Figure 13: Self-Management Proficiency Levels

Self-Management Proficiencies by Jurisdiction

The distributions of adolescents within each of the four jurisdictions across the proficiency levels are shown in Figure 14. As can be seen, most adolescents in all four jurisdictions perform within the Consolidating range. There is a slight skew in the distribution of the Zanzibar adolescents, with fewer than expected at the lowest level, and more than expected at the higher levels.

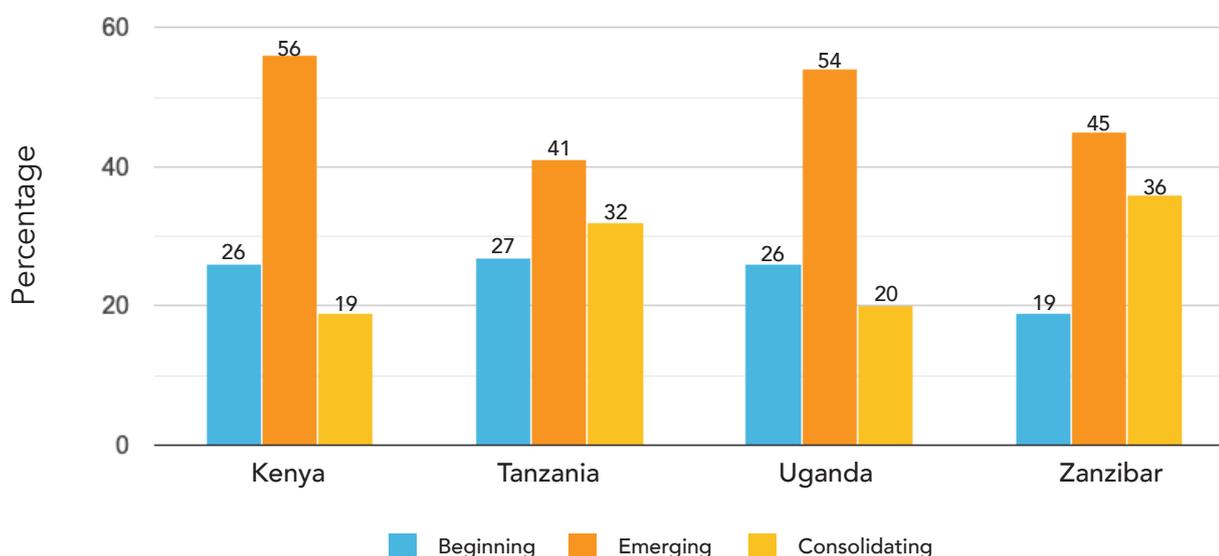


Figure 14: Self-Management Proficiency Levels by Jurisdiction

Self-Management Proficiencies by Selected Characteristics

Gender had no impact on *self-management*; in other words, males and females performed similarly to each other. Similarly, there are no associations between disability status of the adolescents and *self-management*. Information on age and education status is provided, since these two factors appear to be associated with performance levels.

Table 20: Self-Management Proficiency Levels of Adolescents by Selected Characteristics

Adolescents' characteristics		Self-management proficiency levels		
		Beginning	Emerging	Consolidating
		% of adolescents		
Gender	Male	26.3	50.3	23.5
	Female	26.2	51.0	22.8
Age	13–14	29.9	50.1	20.0
	15–17	22.7	51.2	26.1
Education level	Primary	29.8	51.5	18.7
	Secondary	15.8	49.7	34.5
Disability status	No form of disability	26.2	50.6	23.2
	At least 1 form of disability	26.5	51.0	22.6

Age has an influence on the demonstrated proficiencies of adolescents. Older adolescents demonstrate higher proficiencies compared to the younger adolescents. For instance, 26.1% of the adolescents from 15 to 17 years of age compared to 20% of the adolescents aged 13 to 14 years, are sufficiently self-aware and confident to respond adaptively even when directly confronted or attacked (Consolidating). At Beginning level, 22.7% of adolescents from 15 to 17 years of age compared to 29.9% of the adolescents aged 13 to 14 years, are unable to regulate negative emotions or responses.

Education level is also associated with increasing proficiencies. More educated adolescents demonstrated higher proficiencies compared to the less educated adolescents. For instance, 34.5% of the adolescents who have reached the secondary level of education compared to 18.7% of those who have reached the primary level of education, are sufficiently self-aware and confident to respond adaptively even when directly confronted or attacked (Consolidating). At Beginning, 15.8% of the adolescents with a secondary level of education compared to 29.8% of the adolescents with a primary level of education are unable to regulate negative emotions or responses.

Association between Self-Management and Basic Literacy

The distribution of the adolescents' *self-management* proficiencies by their basic literacy proficiencies shows some meaningful associations (Figure 15). Adolescents who are 'fluent' readers tended to demonstrate higher *self-management* proficiencies compared to those who are 'not fluent' readers. For instance, 18.1% of the adolescents who are fluent readers, compared to 11.1% of those who are non-fluent readers, are sufficiently self-aware and confident to respond adaptively even when directly confronted or attacked (Consolidating). Then 27.4% of the adolescents who are fluent readers, compared to 42.4% of those who are non-fluent readers, are unable to regulate negative emotions or responses.

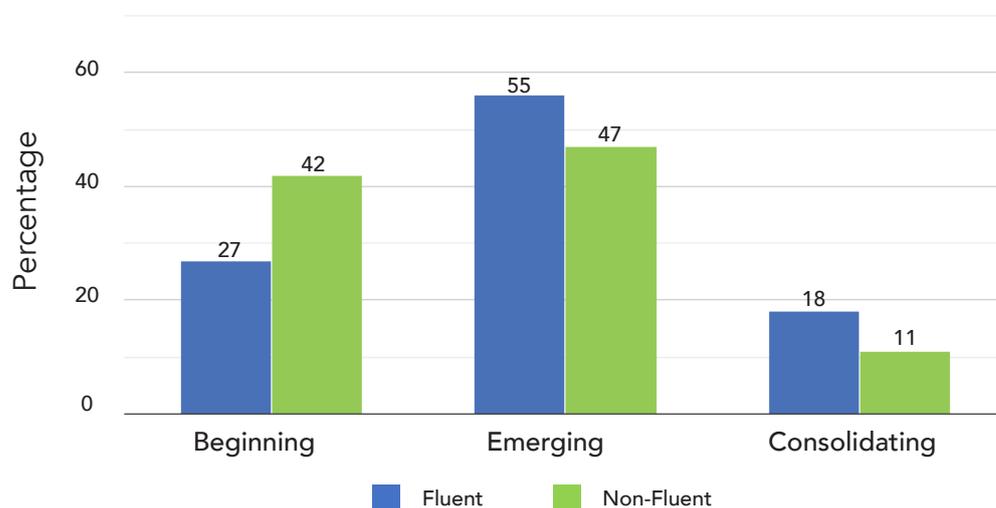


Figure 15: Self-Management Proficiencies of Adolescents by Basic Literacy

Association between Self-Management and Digital Literacy

The distribution of the adolescents' *self-management* proficiencies by their digital literacy presents some meaningful associations (Figure 16). Adolescents who are competent in digital literacy tend to demonstrate higher *self-management* proficiencies compared to their less digitally literate counterparts. For instance, 18.3% of the adolescents who are able to use technology with ease, compared to 9.7% of the adolescents who are not able to use technology, are sufficiently self-aware and confident to respond adaptively even when directly confronted or attacked (Consolidating). At Beginning, 24.7% of the adolescents who are able to use technology with ease, compared to 47% of the adolescents who are not able to use technology, are unable to regulate negative emotions or responses.

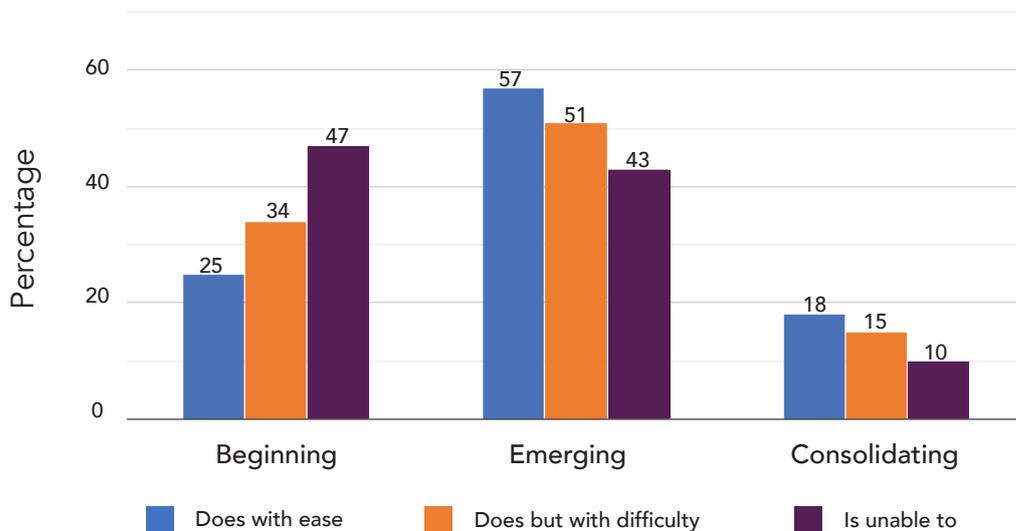


Figure 16: Self-Management Proficiencies of Adolescents by Digital Literacy Competence

Perspective Taking Proficiency Levels

For the second subskill of self-awareness, *perspective taking*, only 5.3% of the adolescents are aware that others act on the basis of multiple factors, both personal and community related (Proficient). Most (64.7%) of the adolescents were aware that others may be impacted by multiple factors. They were, however, less able to see views on self from the perspective of others.

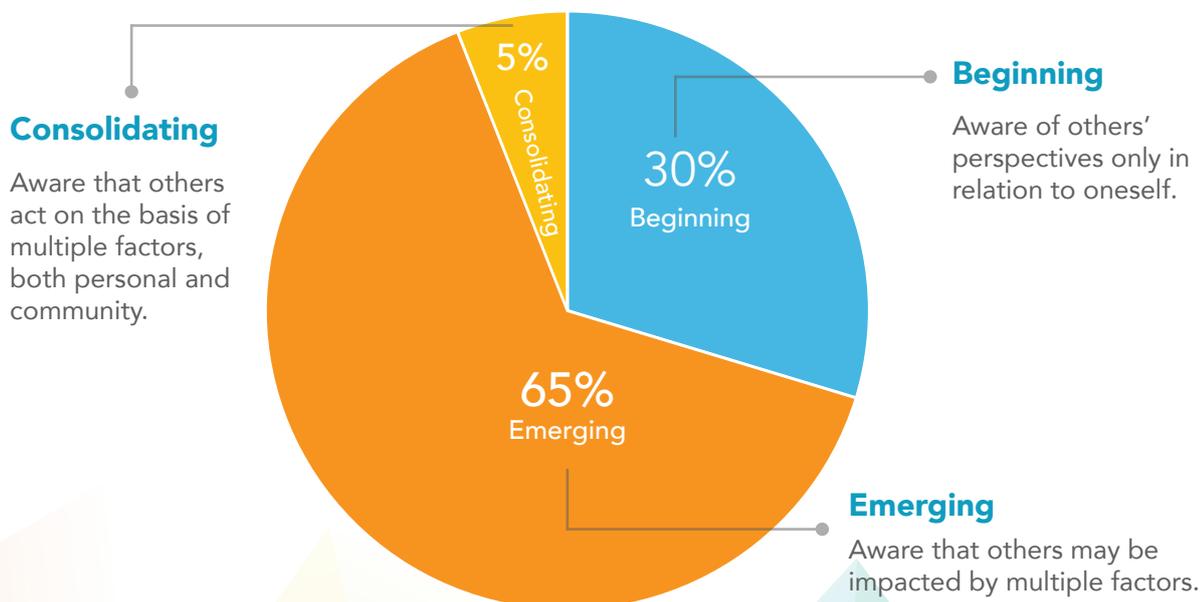


Figure 17: Self-Management Proficiencies of Adolescents by Digital Literacy Competence

Perspective Taking Proficiencies by Jurisdiction

The distributions across jurisdictions are comparatively similar to those for *self-management*. The lower proportion of adolescents performing at the highest level is a clear indication of the greater complexity of this skill, which perhaps requires more experience or maturation.

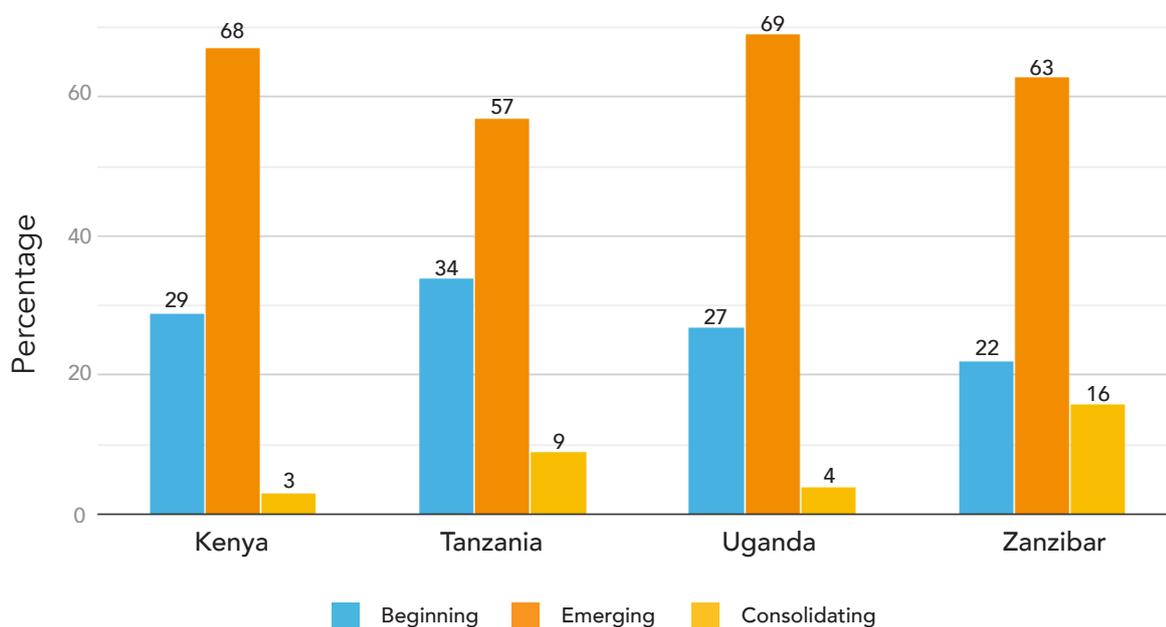


Figure 18: Perspective Taking Proficiencies of Adolescents by Digital Literacy Competence

Perspective Taking Proficiencies by Selected Characteristics

Gender had no impact on problem solving; in other words, males and females performed similarly to each other. Similarly, there are no associations between disability status of the adolescents and perspective taking. Information on age and education status is provided, since these two factors appear to be associated with performance levels.

Table 21: Perspective Taking Proficiency Levels of Adolescents by Selected Characteristics

Adolescents' characteristics		Self-management proficiency levels		
		Beginning	Emerging	Consolidating
		% of adolescents		
Gender	Male	30.3	64.4	5.4
	Female	29.8	65.0	5.1
Age	13–14	35.2	60.9	3.9
	15–17	25.1	68.4	6.6
Education level	Primary	34.8	61.7	3.5
	Secondary	16.8	73.5	9.8
Disability status	No form of disability	29.9	64.6	5.4
	At least 1 form of disability	30.7	65.2	4.1

Age has an influence on the demonstrated proficiencies of adolescents. Older adolescents demonstrate higher proficiencies compared to younger adolescents. For instance, 6.6% of the adolescents from 15 to 17 years of age compared to 3.9% of the adolescents aged 13 to 14 years, are aware that others act on the basis of multiple factors, both personal and communal (Proficient). On Emerging, 25.1% of adolescents from 15 to 17 years of age compared to 35.2% of the adolescents aged 13 to 14 years, are aware of others' perspectives only in relation to oneself.

Education level is also associated with increasing proficiencies. More educated adolescents demonstrated higher proficiencies compared to the less educated adolescents. For instance, 9.8% of the adolescents who have reached secondary level of education compared to 3.5% of those who have reached primary level of education, are aware that others act on the basis of multiple factors, both personal and community (Proficient). On Emerging, 16.8% of the adolescents with a secondary level of education compared to 34.8% of the adolescents with a primary level of education, are aware of others' perspectives only in relation to oneself.

Association between Perspective Taking and Basic Literacy

The distribution of the adolescents' *perspective taking* proficiencies by their basic literacy presents some meaningful associations (Figure 19). Adolescents who are 'fluent' readers tended to demonstrate higher *perspective taking* proficiencies compared to those who are 'not fluent' readers.

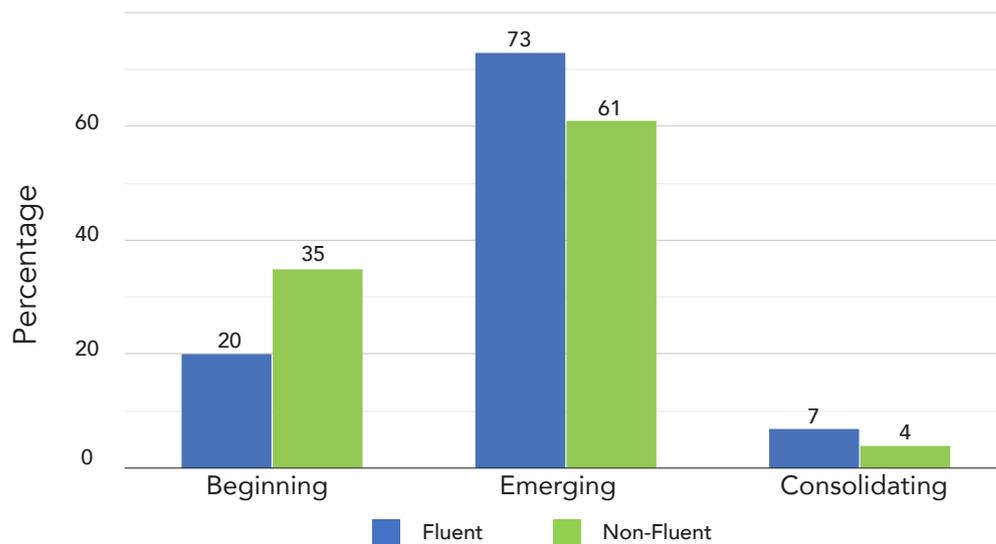


Figure 19: Perspective Taking Proficiencies of Adolescents by Digital Literacy Competence

Association between Perspective Taking and Digital Literacy

The distribution of the adolescents' *perspective taking* proficiencies by their digital literacy proficiencies presents some meaningful associations (Figure 20). Adolescents who are competent in digital literacy tended to demonstrate higher *perspective taking* proficiencies compared to their counterparts.

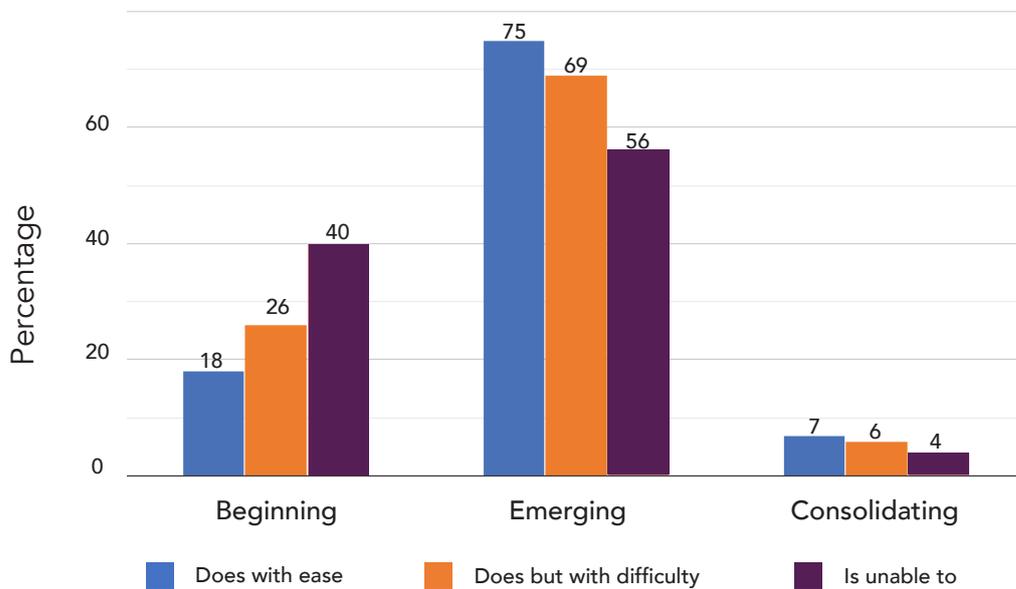


Figure 20: Perspective Taking Proficiencies of Adolescents by Digital Literacy Competence



Summary of Self-Awareness

The Measurement

The self-awareness tool consists of five tasks, which together generate twelve items. A task consists of a brief description of a situation, with items targeting different aspects of an adolescent's self-awareness proficiency. The five tasks follow slightly different patterns. The items assess the adolescent's self-awareness through two subskills, *self-management* and *perspective taking*.

The two scales demonstrate high reliability, and each contribute robustly to the overarching skill. Although the association between the two subskills is strong, *perspective taking* appears slightly more difficult to demonstrate than does *self-management*. This can be seen in Figure 11 where adolescents performing in the top category of *perspective taking* are overlapping with the two top categories of responses for *self-management*. Reporting of results for each of the subskills provides useful information about adolescents' self-awareness.

The Results

The self-awareness tool is effective at differentiating between adolescents in terms of their proficiencies. This assessment can therefore give an indication of adolescents' proficiencies from very low levels to higher levels for both subskills and the overarching skill. The results provide information across the subskills that could be used to begin the design of instructional programs to improve performance in each of these subskills. For example, since *self-management* appears to be somewhat 'easier' for adolescents to demonstrate, particularly at the lower and medium levels, some reflective activities within instructional settings could introduce them to consideration of how others might also experience the emotions and responses that they themselves are able to recognise and manage. Data indicates that adolescents find *perspective taking* more challenging than *self-management*. Although results are provided for the overarching construct, it is recommended that reporting at the subskill level may be used for descriptive and intervention purposes.

3.4 Respect

This section describes that part of the ALiVE tool ('the tool') used to gather data on the respect (RT) proficiencies of the adolescents.

The RT assessment consists of four tasks, with a set of 10 items. Each task includes a brief description of a situation, with items targeting different aspects of this situation to serve as a sample of the concept of respect in terms of regard for others. Respect is seen as a value. All four tasks follow the same pattern, with their items targeting a 'step-by-step' approach to respect. The items assess the adolescent's regard for others—the awareness not to hurt another person physically, emotionally, spiritually, or psychologically. The tasks are numbered 1, 2, 3, and 6 (a numbering convention derived from the development of the Respect tool which included six tasks in field testing). The final tool provides 10 data points from the adolescent's completion of all four tasks, each with its items (Table 22).

Table 22: Tasks and Items Contributing to the Respect Scale

Constructs	Items	#
Respect – Regard for others	RT1a, RT1b, RT1d, RT2a, RT2b, RT3a, RT3e, RT6a, RT6b, RT6c	10

Each task is read aloud to the adolescent. This is followed by asking questions, the answers to which provide item-level data. The coding of responses is enacted in real time, with test administrators (being familiar with three coding rubrics for each item) marking the appropriate responses encoded on the KoboCollect application installed on handheld devices.

PSYCHOMETRIC PROPERTIES

The data demonstrate that most items are similarly patterned from the perspective of gender (no differences), age, and education (increasing proficiency). The items also contribute to the scale in the anticipated way. Description about distribution of items is provided, followed by information that shows how each item contributes to the hypothesised construct of respect—regard for others.

Adolescents' responses as defined by the coding rubrics across the performance levels are illustrated. The distributions are shown by gender, age, and education status. Responses at Beginning are typically null responses, that is, responses that are not related to the task or to the specific item.

Table 23: Tasks Respect – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2
		% of adolescents (n=45,442)		
Item RT1a				
Gender	Male	28.8	55.9	15.3
	Female	29.0	56.0	15.0
Age	13–14	32.2	55.0	12.8
	15–17	25.7	56.9	17.4
Education level	Primary	31.6	55.9	12.5
	Secondary	20.5	57.9	21.6
Item RT1b				
Gender	Male	35.5	50.4	14.1
	Female	37.2	49.1	13.7
Age	13–14	39.6	48.1	12.3
	15–17	33.1	51.4	15.5
Education level	Primary	39.5	48.6	11.9
	Secondary	27.8	53.2	19.0
Item RT1d				
Gender	Male	45.2	34.0	20.8
	Female	45.0	34.0	21.0
Age	13–14	50.2	32.5	17.3
	15–17	40.1	35.5	24.5
Education level	Primary	50.1	33.0	16.9
	Secondary	32.4	37.0	30.6
Item RT2a				
Gender	Male	30.0	37.5	32.6
	Female	30.2	37.5	32.3
Age	13–14	33.4	36.4	30.3
	15–17	26.8	38.6	34.6
Education level	Primary	33.1	37.6	29.3
	Secondary	21.9	37.3	40.8
Item RT2b				
Gender	Male	26.2	32.8	41.0
	Female	25.5	33.3	41.2
Age	13–14	30.0	32.5	37.5
	15–17	21.7	33.6	44.7
Education level	Primary	29.5	33.4	37.0
	Secondary	15.1	32.7	52.3
Item RT3a				
Gender	Male	36.0	50.8	13.2
	Female	35.4	50.8	13.8
Age	13–14	38.7	50.1	11.2
	15–17	32.7	51.5	15.8
Education level	Primary	38.7	50.5	10.9
	Secondary	27.1	52.9	20.1

		Score 0	Score 1	Score 2
		% of adolescents (n=45,442)		
Item RT3e				
Gender	Male	30.2	47.9	21.9
	Female	28.8	48.2	23.0
Age	13–14	32.9	47.9	19.2
	15–17	26.1	48.2	25.7
Education level	Primary	33.1	47.7	19.2
	Secondary	18.9	50.1	31.0
Item RT6a				
Gender	Male	14.3	50.8	34.9
	Female	12.9	49.1	38.1
Age	13–14	15.2	52.6	32.2
	15–17	11.9	47.3	40.8
Education level	Primary	14.8	53.8	31.5
	Secondary	7.5	42.0	50.5
Item RT6b				
Gender	Male	28.9	54.4	16.8
	Female	28.4	54.0	17.7
Age	13–14	31.9	53.0	15.1
	15–17	25.4	55.3	19.3
Education level	Primary	31.8	53.6	14.6
	Secondary	19.2	57.2	23.6
Item RT6c				
Gender	Male	26.6	42.1	31.4
	Female	26.3	40.5	33.3
Age	13–14	29.9	40.8	29.4
	15–17	23.0	41.7	35.3
Education level	Primary	29.4	41.5	29.2
	Secondary	17.6	40.7	41.8

For all 10 items, similar patterns in the responses of males and females can be observed. In regard to age, there is a pattern of responses of older adolescents moving from less to greater regard for others. Similarly, for education status, there is a pattern of responses of more educated adolescents moving from less to more proficient performance Levels.



Summary of the Respect Tool

The average inter-item correlation coefficient of the respect tool ranges from 0.32 to 0.33, suggesting that while the items are reasonably homogeneous, they each contribute unique variance to the scale. This is confirmed by the fact that the items-rest correlation coefficients range from 0.48 to 0.55, suggesting that each item associates well with the other items in the scale. The Cronbach's alpha reliability coefficient for the respect tool is $\alpha=0.83$, indicating an acceptable level of reliability.

Psychometric Properties: Item Fit Statistics

This section presents information on the item-fit statistics estimated based on the Rasch partial credit model. These fit statistics and this spread provide evidence for construct and criterion validity.

Table 24: Item Fit Statistics for Respect

Item	Unweighted Fit			Weighted Fit		
	Fit value	t-stat	p-value	Fit value	t-stat	p-value
RT1a	0.94	-10.11	0.000	0.95	-8.74	0.000
RT1b	0.94	-9.50	0.000	0.95	-7.75	0.000
RT1d	0.97	-3.35	0.001	1.00	-0.92	0.359
RT2a	1.11	14.42	0.000	1.09	16.15	0.000
RT2b	1.07	8.46	0.000	1.06	10.14	0.000
RT3a	0.95	-7.53	0.000	0.97	-5.91	0.000
RT3e	0.95	-8.37	0.000	0.96	-6.59	0.000
RT6a	1.04	5.86	0.000	1.04	6.42	0.000
RT6b	0.95	-7.47	0.000	0.97	-5.66	0.000
RT6c	1.08	11.15	0.000	1.08	13.19	0.000

All items hypothesized to measure self-awareness demonstrated 'good' fit. That is to say, the weighted mean-square values were all between 0.7 and 1.3.

Respect: Differential Item Functioning

Overall, there is negligible DIF in RT across the four jurisdictions. In exploring the slight differences that do occur, it is clear that they are primarily due to group difference in performance rather than bias. It can therefore be concluded that items for RT pattern very similarly across all four jurisdictions. Figure 21 provides an example that illustrates the greatest differences found from all RT construct comparisons, between jurisdictions.

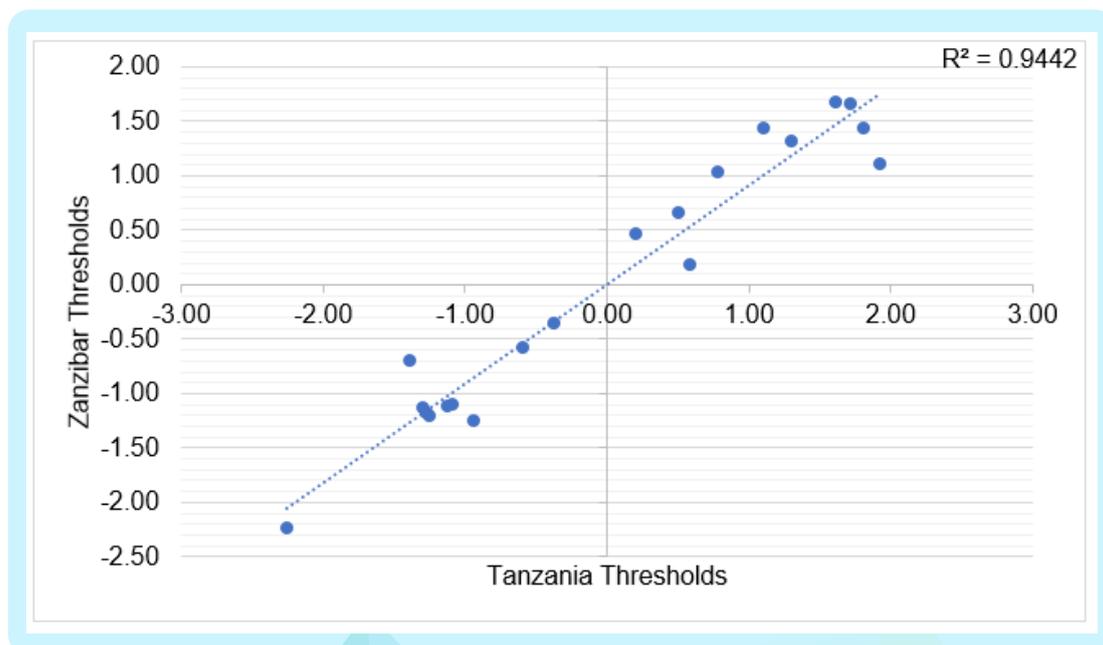


Figure 21: Scatterplots for Respect Item Thresholds: Zanzibar versus Tanzania

Respect: Item Spread and Coding of Responses

In order to evaluate how difficult the items were for the adolescents, the Rasch partial credit model was used. Figure 23 illustrates how the 10 items prompted adolescents' responses. The person-ability map based on the Rasch model provides a look at how well items are spread out to define increasing proficiencies, and whether the items are separated enough to measure the respondents' abilities.

The person-ability map shows that the coding of responses from low to higher levels accurately represents increasing levels of respect for others. In other words, Cat1 (the lowest coded response) items appear below Cat2 (the highest coded response). This finding validates the approach to item design, which allowed for clearly identifiable different levels of responses and their coding.

Respect: Overall Distribution of Items across Persons

The set of items taps into a wide range of proficiencies, with individual items well distributed throughout the response space. The coding levels are reasonably well separated, to justify the attribution of descriptive scoring statements for four levels of the RT scale.

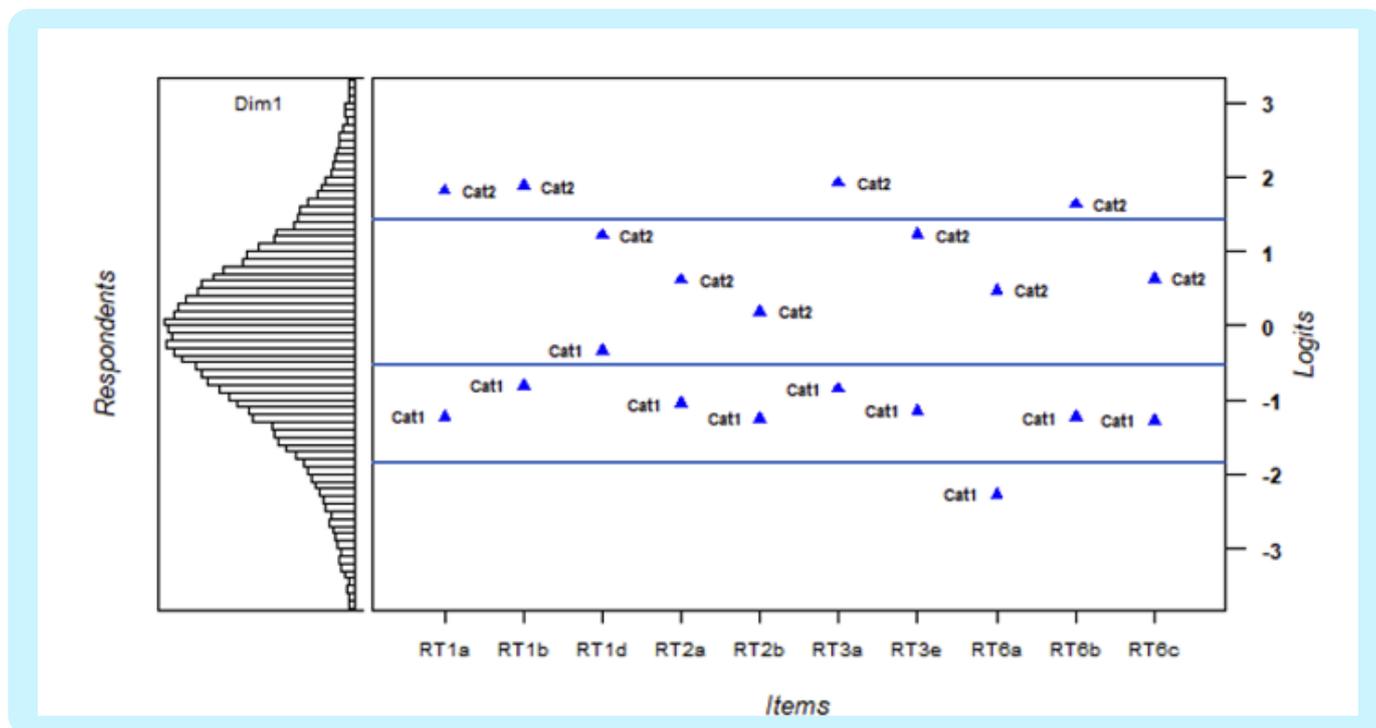


Figure 22: Person-Ability Map for Respect Scale

NOTE

Based on the analyses of items in terms of their logit scores and locations relative to each other, descriptive categories of performance were determined as follows: (Lowest thru -2.20 logit = Emerging); (-2.19 thru -0.500 logit = Consolidating); (-0.4999 thru 1.450 logit = Proficient); (1.451 thru Highest = Proficient).

RESPECT PROFICIENCIES OF ADOLESCENTS

Descriptive Proficiency Statements for Respect

The descriptors presented in Table 25 are based on analysis of levels of quality of the responses as coded into category scores, and on how these are located in the person-map space (Figure 23).

Table 25: Descriptive Statements for Respect

Construct	Beginning Adolescent is...	Emerging Adolescent is...	Consolidating Adolescent is...	Proficient Adolescent is...
Respect	Unable to respond in a relevant way.	Aware of infringement of rights, or of bad behaviour by one person towards another but does not 'call it out'.	Able to interpret bad behaviour as lack of respect for others or self, and may take conciliatory steps to resolve situations.	Aware of links between respect for property and respect for person, and will act in a respectful way towards others and in defence of others and self.

Distribution of Respect Results

Overall, a large proportion of the adolescents were aware of poor behaviour (34.4%), and able to interpret this as lack of respect for others or self, with need for conciliatory steps (50.2%). But very few (8%) adolescents were aware of links between respect for property and respect for people and will act in a respectful way towards others and in defence of others and self.

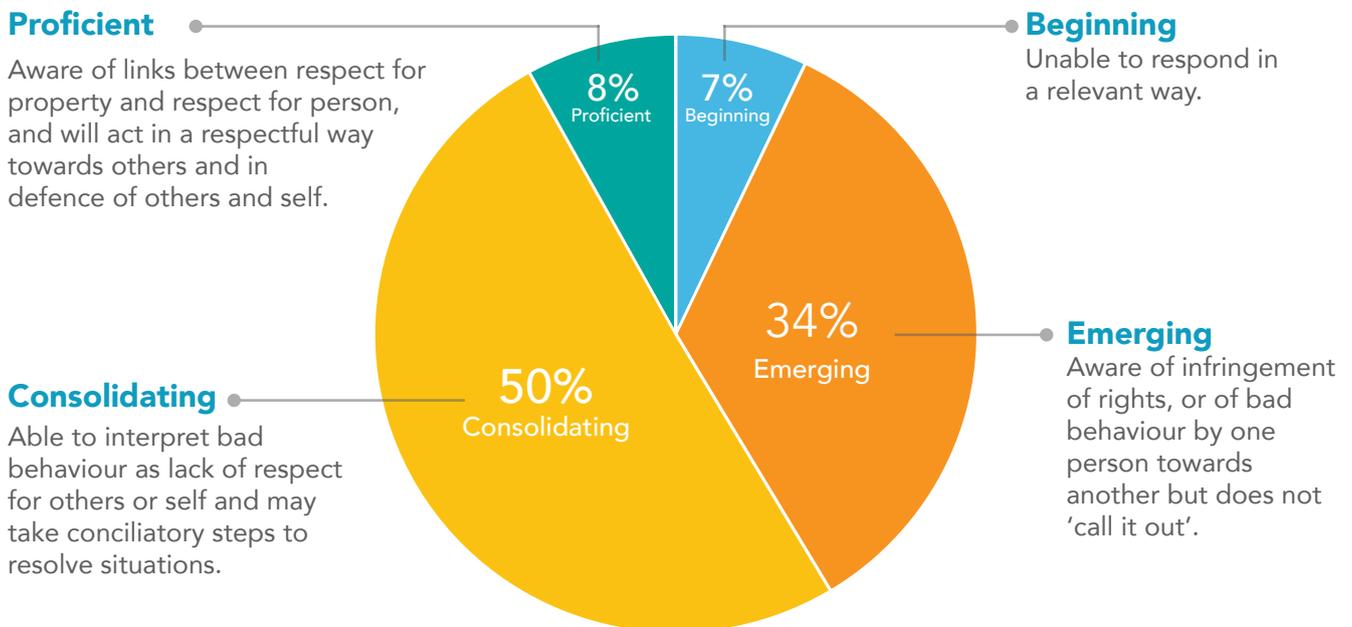


Figure 23: Respect Proficiency Levels

Respect Proficiencies by Jurisdiction

The distributions of adolescents within each of the four jurisdictions across the proficiency levels are shown in Figure 24. As can be seen, most adolescents in all four jurisdictions perform within the Proficient range: *able to interpret bad behaviour as lack of respect for others or self, and may take conciliatory steps to resolve situations*. There is a slight skew in the distribution of the Zanzibar adolescents, with more than expected at the higher level.

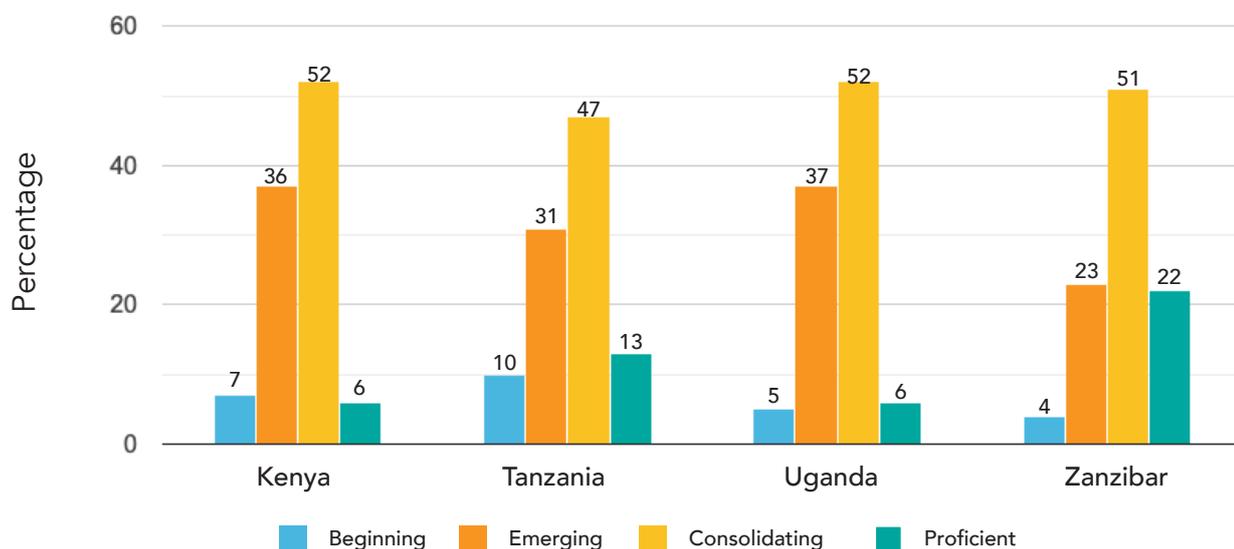


Figure 24: Respect proficiency levels by jurisdiction

Respect Proficiencies by Selected Characteristics

Gender had no impact on respect; in other words, males and females performed similarly to each other. Similarly, there are no associations between disability status of the adolescents and respect. Information on age and education status is provided, since these two factors appear to be associated with performance levels

Table 26: Respect Proficiency Levels of Adolescents by Selected Characteristics

Adolescents' characteristics		Respect proficiency levels			
		Beginning	Emerging	Consolidating	Proficient
		% of adolescents			
Gender	Male	7.8	34.7	49.3	8.2
	Female	7.0	34.2	51.0	7.8
Age	13–14	9.2	38.5	46.1	6.2
	15–17	5.6	30.5	54.1	9.8
Education level	Primary	8.6	39.1	46.5	5.8
	Secondary	2.8	23.1	60.5	13.7
Disability status	No form of disability	7.4	34.5	49.8	8.4
	At least 1 form of disability	7.6	34.2	52.8	5.5

Age has an influence on the demonstrated proficiencies of adolescents. Older adolescents demonstrated higher expression for respect in terms of regard for others compared to the younger adolescents. For instance, 9.8% of the adolescents from 15 to 17 years of age compared to the 6.2% of the adolescents aged 13 to 14 years, are aware of links between respect for property and respect for person and will act in a respectful way towards others and in defence of others and self (Proficient). On Consolidating, 30.5% of adolescents from 15 to 17 years of age compared to 38.5% of the adolescents aged 13 to 14 years, are aware of infringement of rights, or of bad behaviour by one person towards another, but will not 'call it out'.

The education level is also associated with increasing proficiencies. More educated adolescents demonstrated higher expression of respect in terms of regard compared to the less educated adolescents. For instance, 13.7% of the adolescents who have reached the secondary level of education compared to 5.8% of those who have reached the primary level of education, are aware of links between respect for property and respect for person, and will act in a respectful way towards others and in defence of others and self. On Emerging, 2.8% of the adolescents with a secondary level of education compared to 8.6% of the adolescents with a primary level of education are unable to respond in a relevant way.

Association between Respect and Basic Literacy

The distribution of the adolescents' expression of respect proficiencies by their basic literacy proficiencies shows some meaningful associations (Figure 25). Adolescents who are 'fluent' readers tended to demonstrate higher expression of respect compared to those who are 'not fluent' readers. For instance, 59.3% of the adolescents who are fluent readers, compared to 45.6% of those who are non-fluent readers, are able to interpret bad behaviour as lack of respect for others or self, and may take conciliatory steps to resolve situations (Proficient). Then 26.0% of the adolescents who are fluent readers, compared to 38.8% of those who are non-fluent readers, are aware of infringement of rights, or of bad behaviour by one person towards another but do not 'call it out' (Consolidating).

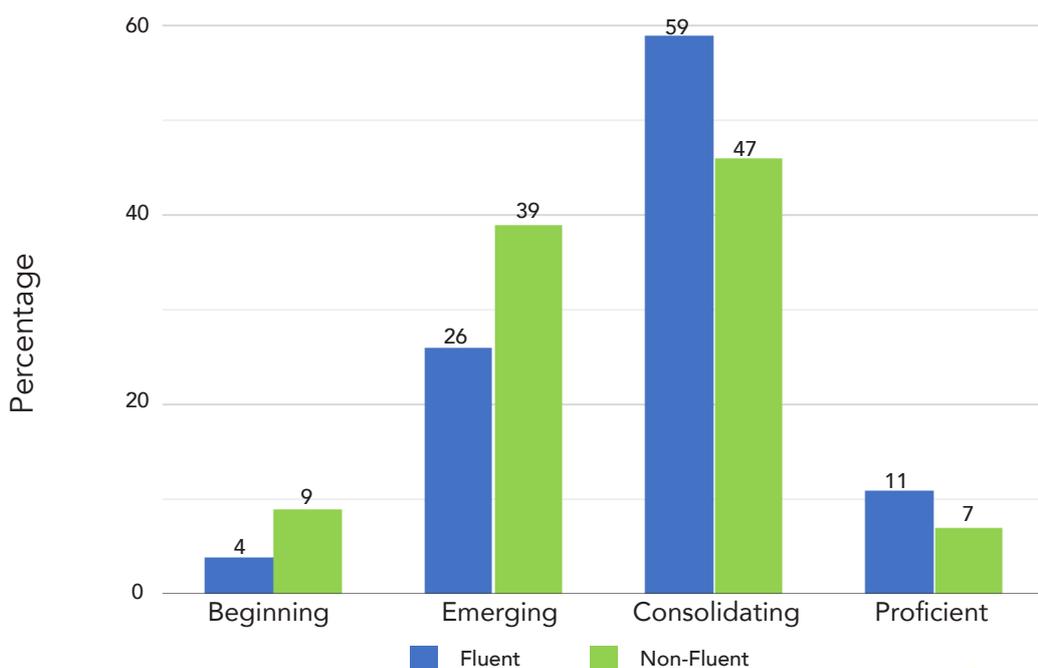


Figure 25: Respect Proficiencies of Adolescents by Basic Literacy

Association between Respect and Digital Literacy

The distribution of the adolescents' expression of respect proficiencies by their digital literacy presents some meaningful associations (Figure 26). Adolescents who are competent in digital literacy tend to demonstrate higher expression of respect compared to their less digitally literate counterparts. For instance, 59.8% of the adolescents who are able to use technology with ease, compared to 42.4% of the adolescents who are not able to use technology, are able to interpret bad behaviour as lack of respect for others or self, and may take conciliatory steps to resolve situations (Proficient). On Emerging, 2.3% of the adolescents who are able to use technology with ease, compared to 11.9% of the adolescents who are not able to use technology, are unable to respond in a relevant way.

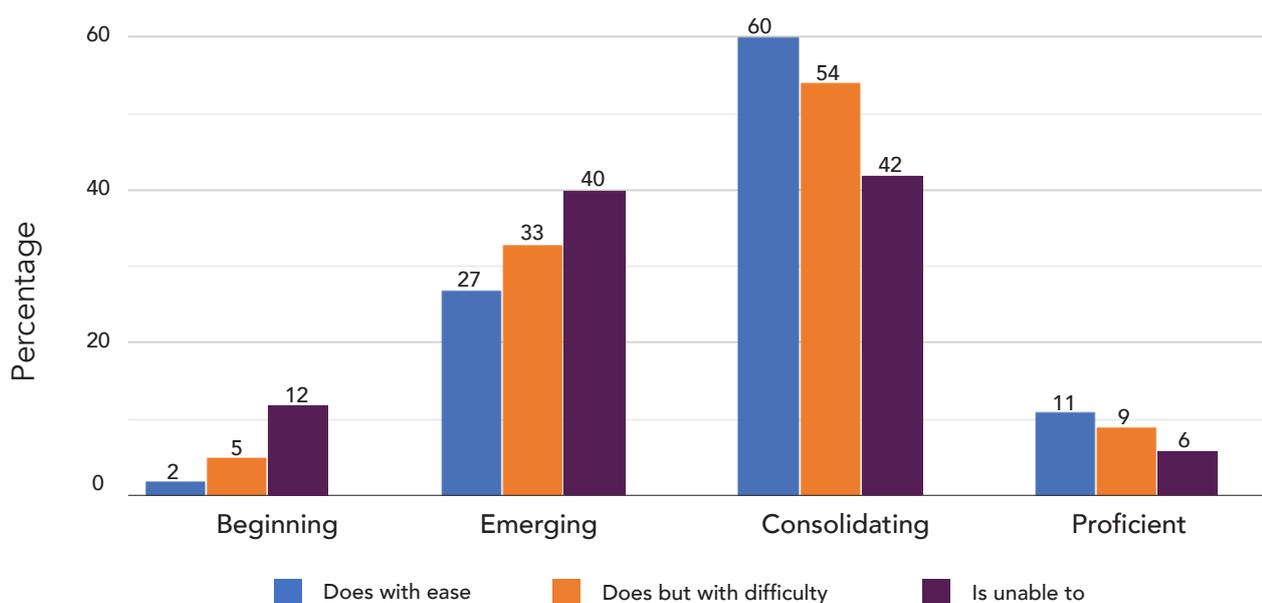


Figure 26: Respect Proficiencies of Adolescents by Digital Literacy Competence



Summary of Respect

The Measurement

The respect tool consists of four tasks, which together generate ten items. A task consists of a brief description of a situation, with items targeting slightly different aspects of an adolescent's respect in terms of regard for others. This regard concerns being aware of the rights of others and self, and therefore the awareness not to hurt another person physically, emotionally, spiritually, or psychologically.

The respect scale demonstrates high reliability in which each item contributes robustly to the overarching dimension. This also confirms the use of the unidimensional model in exploring adolescents' proficiencies in this aspect of respect—a reasonable approach.

The Results

The assessment tool is effective for differentiating between adolescents in terms of their respect for others. Each of the items contributes meaningfully to the overarching dimension: regard for others. The respect tool can therefore capture indications of respect from very low levels to higher levels.

The results indicate that most adolescents are able to interpret bad behaviour as a lack of respect for others, and may take conciliatory steps to resolve situations, but only a few of them can act in a respectful way towards others and in defence of others and self in threatening situations.

3.5 Collaboration

A total of 20,116 adolescents (49% males and 51% females) completed the collaboration tool. These adolescents engaged in the collaboration task in groups that were boys only (31%), girls only (32%), or mixed – boys and girls (37%).

This section describes that part of the ALiVE tool ('the tool') used to gather data on the collaboration (CT) proficiencies of the adolescents and describes those proficiencies. The CT assessment comprises three tasks with a set of 8 items. Each task includes a brief description of a situation, with each item targeting a different aspect of an adolescent's CT proficiency. All three tasks follow the same pattern, with their items targeting a 'step-by-step' approach to CT. The items assess the adolescent's *communication*—which is about listening (receptive) and speaking (expressing); *negotiation*; and working together. Communication is needed for one to reflect on other people's views vis a vis his or her own, including accepting feedback and reaching a consensus; and *working together*, to plan and engage in activities. The tasks are numbered 1, 4, and 6 (a numbering convention derived from the development of the CT tool which included seven tasks in field testing). The final tool provides 8 data points from adolescents' completion of all three tasks, each with its items (Table 27).

Table 27: Tasks and Items Contributing to the Collaboration Scale and Subskills

Constructs		Items	#
Collaboration		CT11, CT12, CT13, CT41, CT42, CT61, CT62, CT63	8
Subskills	Communication	CT11, CT41, CT61	3
	Negotiation	CT12, CT42, CT62	3
	Working together	CT13, CT63	2

Each task was read aloud to the adolescents, in groups of four boys only, girls only, or mixed groups. The adolescents, as a group, were then asked to perform the task according to the instructions read to them. For the first task of making a ball (items CT11, CT12, and CT13), adolescents were not provided with any materials. They were expected to find materials in their environment and creatively engage in the task. For all three tasks, as the adolescents were doing the activity, each assessor observed and took notes regarding the observable behaviours of two adolescents. They created a 2-column page in their notebook and recorded the observations made for each adolescent separately. After completing all three tasks, the assessors used the notes taken to score each adolescent. The coding of responses was enacted in real time, with test administrators (being familiar with the four level coding rubrics) marking the appropriate responses encoded on the KoboCollect application installed on handheld devices.

PSYCHOMETRIC PROPERTIES

Based on the data collected, the items are hypothesised to inform each of the three subskills – *communication, negotiation, and working together*—and contribute to their scales in an expected way. For each subskill, description about distribution of items and their values is provided, followed by information that shows how each item contributes to its hypothesised scale. All items contribute appropriately to their subskills.

Subskill: Communication

This subskill consists of three items: CT11, CT41, and CT61. *This subskill targets an individual's ability to listen (receptive) and speak (expressive).*

Adolescents' observable behaviours as defined by the coding rubrics across the performance levels are illustrated. The distributions are shown by gender, age, and education status.

Table 28: Communication – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=20,112)			
Item CT11					
Gender	Male	8.8	22.2	44.5	24.6
	Female	8.8	24.7	44.9	21.5
Age	13–14	10.1	26.7	44.4	18.8
	15–17	7.5	20.3	45.1	27.1
Education level	Primary	9.7	25.9	44.8	19.7
	Secondary	6.1	18.2	45.3	30.4
Item CT41					
Gender	Male	8.3	22.8	47.5	21.5
	Female	8.2	23.9	47.2	20.6
Age	13–14	9.7	27.0	46.6	16.8
	15–17	6.9	19.8	48.2	25.2
Education level	Primary	9.4	25.8	47.6	17.2
	Secondary	5.1	18.0	47.9	29.1
Item CT61					
Gender	Male	7.7	21.5	46.6	24.2
	Female	7.4	23.7	45.6	23.4
Age	13–14	8.7	25.6	45.9	19.9
	15–17	6.4	19.7	46.3	27.6
Education level	Primary	8.3	25.4	46.5	19.7
	Secondary	4.8	16.6	46.3	32.3

For all three items, similar patterns in the performance levels of males and females can be observed. Also, for all three items, most adolescents achieved performance level Consolidating, described as able to speak and attentive in the discussion. For both age and education status, there is a pattern of observable behaviours of older adolescents or more educated adolescents moving from lower to higher performance levels. In other words, performance levels increase according to age and education status of the adolescents.

Subskill: Negotiation

This subskill is constituted of three items: CT12, CT42, CT62. This subskill targets an individual's ability to reflect on other people's views vis a vis his/hers, including accepting feedback and having a consensus where an agreement is reached.

Table 29: Negotiation – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=20,112)			
Item CT12					
Gender	Male	13.6	28.1	32.1	26.3
	Female	15.6	28.8	32.1	23.6
Age	13–14	17.1	30.2	31.0	21.8
	15–17	12.2	26.8	33.1	28.0
Education level	Primary	16.4	30.2	31.3	22.2
	Secondary	10.2	24.5	24.2	31.2
Item CT42					
Gender	Male	13.1	24.8	32.7	29.3
	Female	14.5	25.7	32.1	27.8
Age	13–14	16.2	27.4	31.6	24.7
	15–17	11.4	23.2	33.2	32.2
Education level	Primary	15.7	27.2	31.8	25.3
	Secondary	9.1	21.1	34.1	35.7
Item CT62					
Gender	Male	12.5	24.7	33.4	29.5
	Female	13.7	24.6	33.6	28.1
Age	13–14	16.4	30.2	31.3	22.2
	15–17	10.2	24.5	34.2	31.2
Education level	Primary	15.1	26.5	33.4	15.0
	Secondary	7.9	20.6	34.5	37.0

For all three items, similar patterns in the performance levels of males and females can be seen. Also, for all three items, most adolescents achieved performance level Consolidating, described as able to question the views of others and takes a position. For all three items, there is a pattern of observable behaviours of older adolescents moving from lower to higher performance levels. Similarly, performance levels increase according to the education level of adolescents, that is to say, there is a pattern of observable behaviours of more educated adolescents moving from lower to higher performance levels.

Subskill: Working Together

This subskill is constituted of two items: CT13, CT63. This subskill targets an individual's ability to work together with others as they plan the activities i.e., listing the materials needed as well as participate in performing the tasks.

Table 30: Working Together – Item Responses by Gender, Age, and Education Status

		Score 0	Score 1	Score 2	Score 3
		% of adolescents (n=20,112)			
Item CT13					
Gender	Male	5.3	21.8	30.3	42.6
	Female	6.2	25.3	30.1	38.4
Age	13–14	5.9	26.0	30.9	37.2
	15–17	5.6	21.2	29.5	43.7
Education level	Primary	5.8	25.0	31.3	37.9
	Secondary	4.7	20.1	28.4	46.8
Item CT63					
Gender	Male	4.8	12.4	42.5	40.3
	Female	5.5	12.7	42.7	39.1
Age	13–14	5.7	14.8	43.2	36.3
	15–17	4.6	10.3	42.1	43.0
Education level	Primary	5.8	14.0	43.8	36.5
	Secondary	2.7	8.8	41.0	47.4

The two items show similar patterns in the performance levels of males and females. For item CT13, most adolescents of both genders achieved performance level Proficient. The items show a pattern of observable behaviours of older adolescents moving from lower to higher performance levels. Similarly, observable behaviours of more educated adolescents move from lower to higher performance levels.

Reliability Analysis of the Collaboration Scales

Each of the three subskill scales draw on items that contribute well to the subskills. Review of how the items contribute to the overarching CT construct indicates high homogeneity of content, supported by the alpha reliability coefficients (Table 31).

Table 31: Summary of Reliability Coefficients for the Collaboration Scales

	# items	Alpha
CT Communication	3	.7733
CT Negotiation	3	.7898
CT Working together	2	.6615
CT Overall	8	.8870

PSYCHOMETRIC PROPERTIES: ITEM FIT STATISTICS

This section presents information on the item fit statistics for the collaboration construct estimated based on the Rasch partial credit model. These fit statistics and this spread provide evidence for construct and criterion validity.

Table 32: Item Fit Statistics for Collaboration

Item	Unweighted Fit			Weighted Fit		
	Fit value	t-stat	p-value	Fit value	t-stat	p-value
CT11	0.98	-2.17	0.030	0.99	-1.16	0.247
CT12	0.96	-4.19	0.000	0.97	-2.65	0.008
CT13	0.92	-7.72	0.000	0.94	-6.09	0.000
CT41	0.99	-1.37	0.170	1.00	0.10	0.923
CT42	0.98	-1.46	0.146	1.01	0.61	0.544
CT61	0.94	-5.20	0.000	0.97	-3.07	0.002
CT62	1.14	9.67	0.000	1.14	13.71	0.000
CT63	1.04	2.81	0.005	1.06	5.57	0.000

All items hypothesized to measure collaboration demonstrated ‘good fit.’ That is to say, the weighted mean-square values were all between 0.7 and 1.3.

Collaboration: Differential Item Functioning

Overall, there is negligible DIF in CT across the four jurisdictions. In exploring the slight differences that do occur, it is clear that they are primarily due to group difference in performance rather than bias. It can therefore be concluded that items for CT pattern very similarly across all four jurisdictions. Figure 27 provides an example that illustrates the greatest differences found from all overarching construct comparisons between jurisdictions.

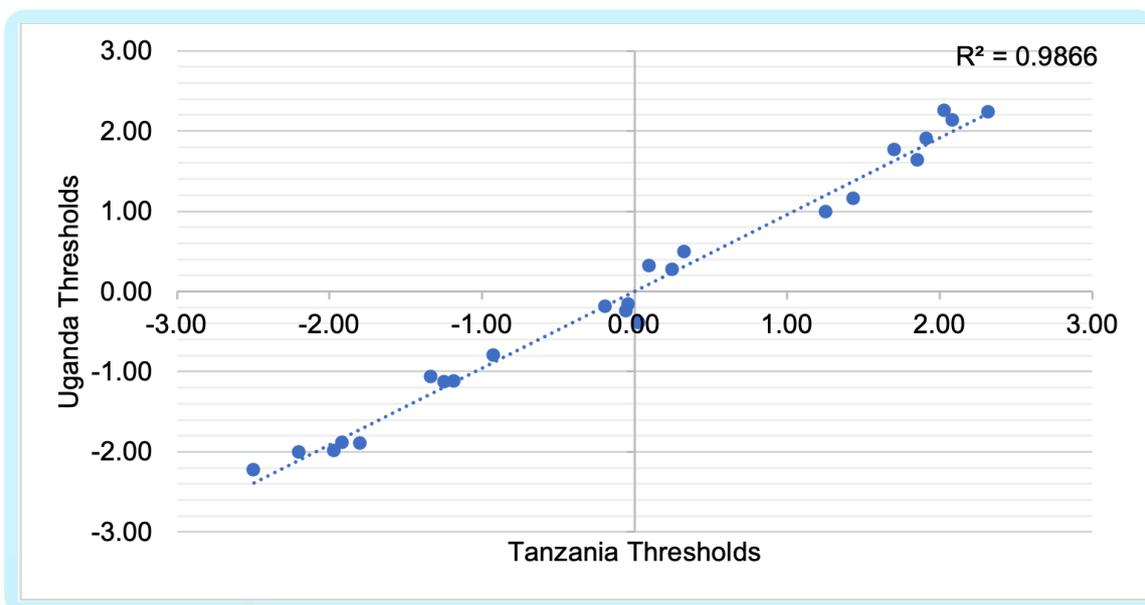


Figure 27: Scatterplot for Collaboration Item Thresholds: Uganda versus Tanzania

Collaboration: Item Spread and Coding of Responses

The Rasch partial credit model was used to evaluate how difficult the three tasks were for the adolescents, and whether one subskill is more difficult to demonstrate than the other. Figure 28 illustrates how the three tasks and 8 items were experienced by the adolescents. The figure shows that the coding of responses from low to higher performance levels accurately represents increasing levels of proficiency. In other words, Cat1 (the lowest level of coded response) items appear below Cat2 and Cat3 (the highest level of coded response), which indicates that the underlying hypotheses about successively more difficult performance are confirmed by the data. This finding validates the approach to item design, which allowed for clearly identifiable different levels of responses and their coding.

Collaboration: Relative Difficulty of Subskills

In order to examine whether both subskills are similarly easy or difficult, items contributing to each of these follow each other, that is, communication (items CT11 to CT61), negotiation (items CT12 to CT62), and working together (items CT13 to CT63), as shown in Figure 28. The subskills contribute in a similar pattern to the range of proficiencies.

Collaboration: Overall Distribution of Items across Persons

The set of items taps into a wide range of proficiencies, with individual items well distributed throughout the response space. The performance coding levels are reasonably well separated in order to justify the attribution of descriptive scoring statements for four categories of proficiencies for the overarching CT construct. The unidimensional solution that treats all items as contributing only to the overarching CT construct is shown in Figure 28.

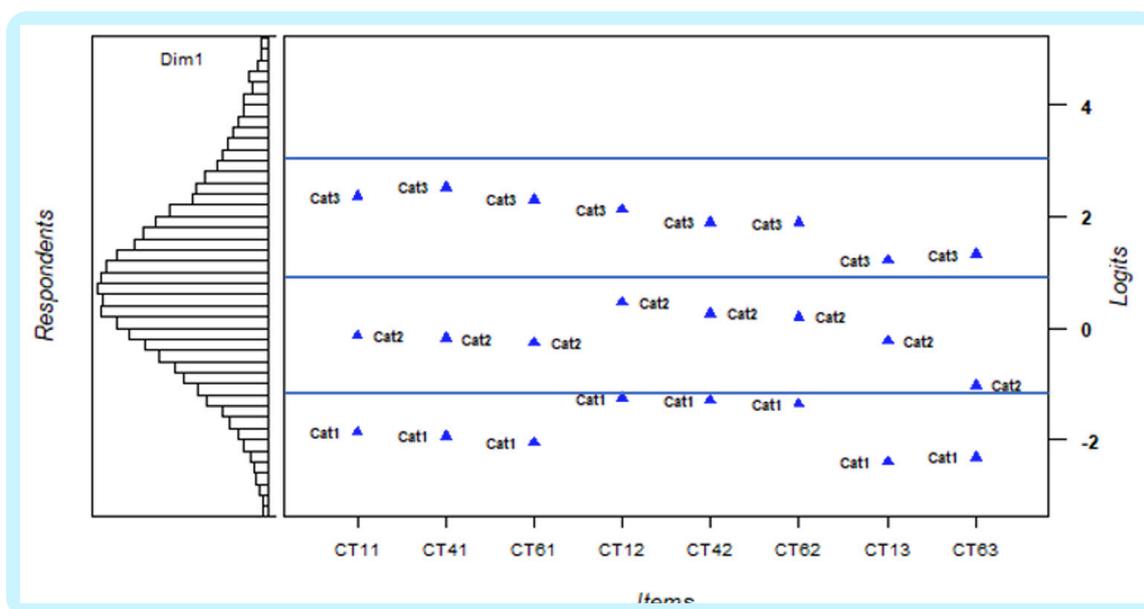


Figure 28: Person-Ability Map for Collaboration Scale (Unidimensional Scale)

NOTE

Based on analysis of items in terms of their logit scores and locations relative to each other, descriptive categories of performance were determined for collaboration as follows: (Lowest thru -1.1 logit = Emerging); (-1.09 thru 0.9 logit = Consolidating); (0.91 thru 3.0 logit = Proficient); (3.1 thru Highest = Proficient).

COLLABORATION PROFICIENCIES OF ADOLESCENTS

Descriptive Proficiency Statements for Collaboration

Table 33 presents the descriptive proficiency statements for the overarching collaboration scale. These descriptors are based on analysis of levels of quality of the responses as coded into category scores, and on how these are located in the person-map space (Figure 28).

Table 33: Descriptive Proficiency Statements for Collaboration

Construct	Beginning Adolescent is...	Emerging Adolescent is...	Consolidating Adolescent is...	Proficient Adolescent is...
Collaboration	Does not engage either by being attentive to discussion, speaking, or through action	Is attentive to the discussion and may query the views of others, but does not contribute in words or actions	Collaborates through speaking and being attentive in discussions, and engaging actively in performance tasks	Collaborates through taking positions and contributing ideas, prompting others, and being attentive to the input of others

Distribution of Collaboration Results

Based on the descriptive statements presented in Table 33 the results for the overarching CT construct are presented. Overall, most of the adolescents were attentive to the discussions; they queried the views of others and actively engaged in the performance tasks but did not contribute in words or actions (44.8%). Relatively few adolescents (10.0%) collaborated through taking positions and contributing ideas, prompting others, and being attentive to the input of others (Proficient).

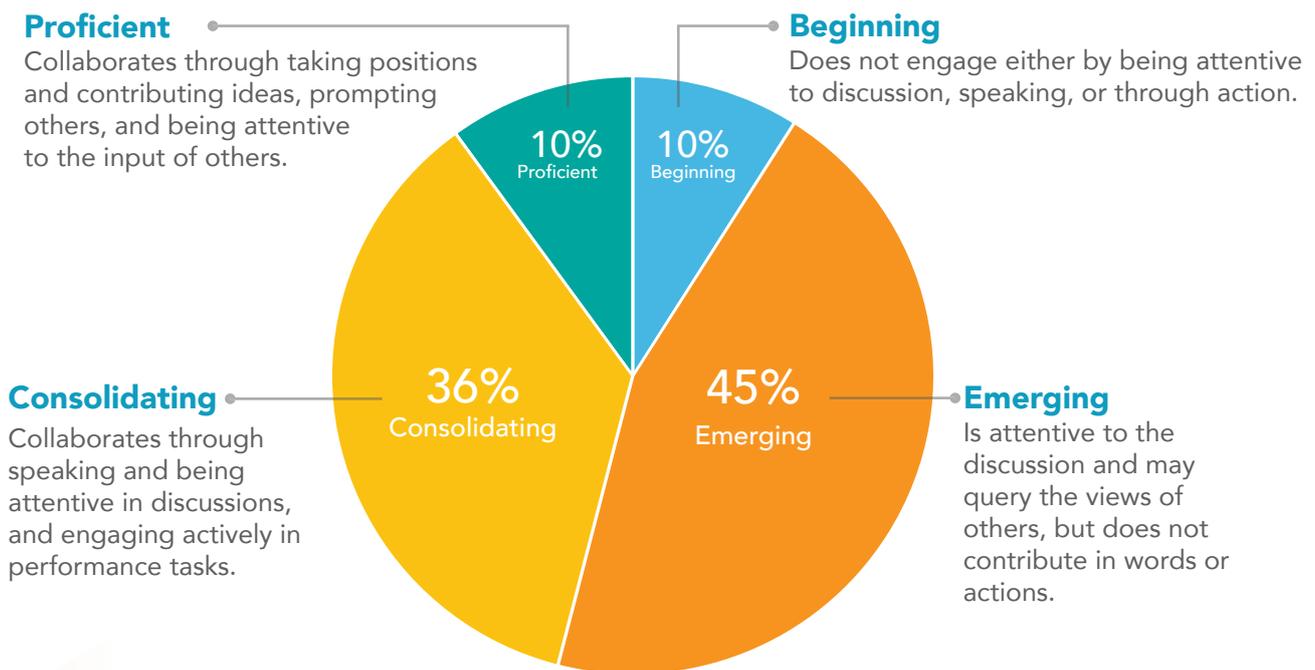


Figure 29: Collaboration Proficiency Levels

Collaboration Proficiencies by Jurisdiction

The distributions of adolescents within each of the four jurisdictions across the proficiency levels are shown in Figure 30. As can be seen, most adolescents in all four jurisdictions perform within the Consolidating range. There is a slight skew in the distribution of the Uganda adolescents, with fewer than expected at the highest level, and more than expected at Consolidating (attentive to the discussions and may query the views of others).

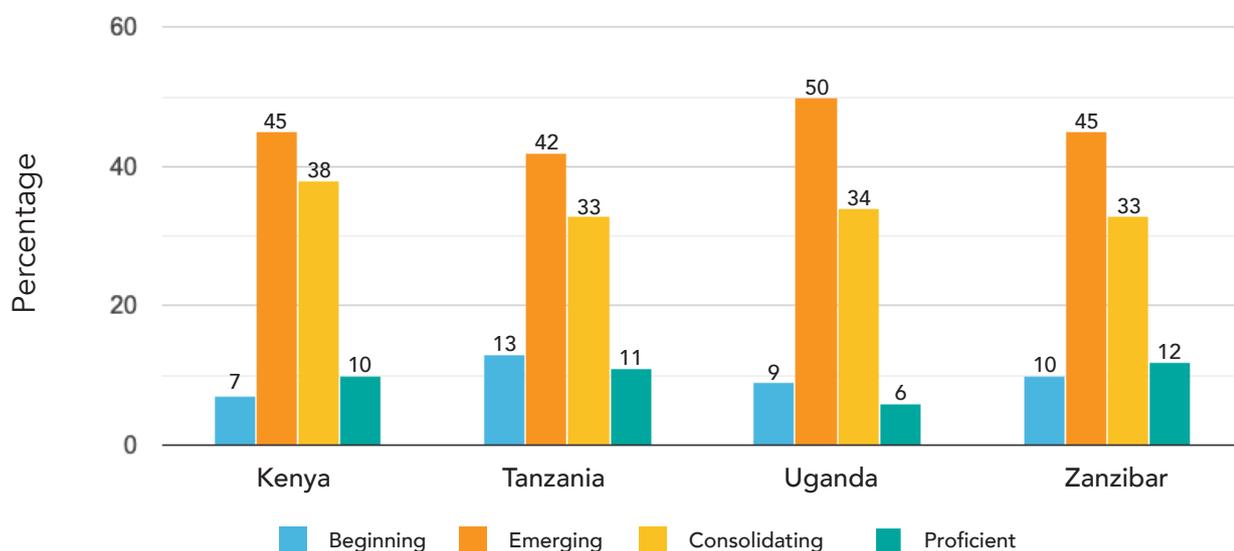


Figure 30: Collaboration proficiencies of adolescents

Collaboration Proficiencies by Selected Characteristics

Adolescents' proficiency levels by their gender, age, education, and disability status are provided in this section.

Table 34: Collaboration Proficiency Levels of Adolescents by Selected Characteristics

Adolescents' characteristics		Beginning	Emerging	Consolidating	Proficient
		% of adolescents			
Gender	Male	7.9	43.3	37.0	11.9
	Female	11.1	46.5	34.4	8.1
Age	13–14	11.7	47.5	34.5	6.4
	15–17	7.4	42.4	36.8	13.3
Education level	Primary	10.8	46.7	33.5	9.0
	Secondary	6.0	40.5	41.4	12.1
Disability status	No form of disability	6.1	38.8	40.7	14.4
	At least 1 form of disability	11.9	49.3	31.9	6.9

Age has an influence on the demonstrated proficiencies of adolescents. Older adolescents demonstrated higher proficiencies compared to the younger adolescents. For instance, 13.3% of the adolescents from 15 to 17 years of age compared to 6.4% of the adolescents aged 13 to 14 years, collaborated through taking positions and contributing ideas, prompting others, and being attentive to the input of others (Proficient). On Emerging, 7.4% of adolescents from 15 to 17 years of age compared to 11.7% of the adolescents aged 13 to 14 years, did not engage either by being attentive to discussion, speaking, or through action.

Education level is also associated with increasing proficiencies. More educated adolescents demonstrated higher proficiencies compared to the less educated adolescents. For instance, 41.4% of the adolescents who have reached the secondary level of education compared to 33.5% of those who have reached the primary level of education, collaborated through speaking and being attentive in discussions, and engaging actively in performance tasks (Proficient). On Emerging, 6.0% of the adolescents with a secondary level of education compared to 10.8% of the adolescents with a primary level of education, did not engage either by being attentive to discussion, speaking, or through action.

Association between Collaboration and Basic Literacy

The distribution of the adolescents' collaboration proficiencies by their basic literacy proficiencies shows some meaningful associations (Figure 31). Adolescents who are 'fluent' readers tended to demonstrate higher collaboration proficiencies compared to those who are 'not fluent' readers. For instance, 14.4% of the adolescents who are fluent readers, compared to 6.9% of those who are non-fluent readers, collaborated through taking positions and contributing ideas, prompting others, and being attentive to the input of others (Proficient). On Emerging, about 6.1% of the adolescents who are fluent readers, compared to 11.9% of those who are non-fluent readers, did not engage either by being attentive to discussion, by speaking, or through action.

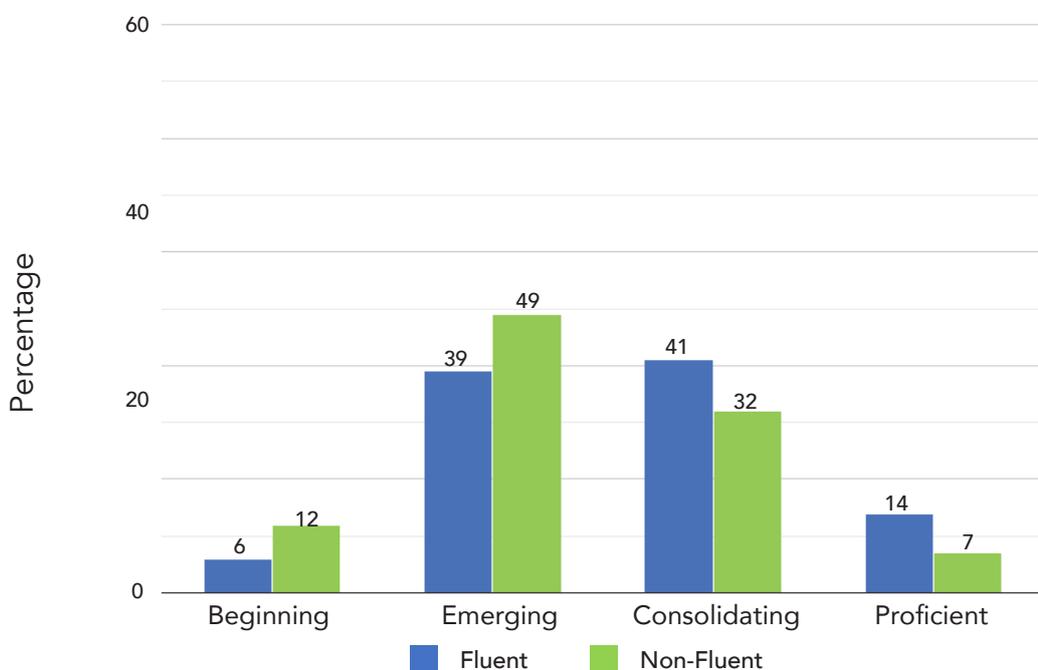


Figure 31: Collaboration Proficiencies of Adolescents by Fluency in Basic Literacy

Association between Collaboration and Digital Literacy

The distribution of the adolescents' collaboration proficiencies by their digital literacy proficiencies shows some meaningful associations (Figure 32). Adolescents who are competent in digital literacy tend to demonstrate higher collaboration proficiencies compared to their less digitally literate counterparts. For instance, 41.8% of the adolescents who can use technology with ease, compared to the 27.4% of the adolescents who are unable to use technology, collaborated through speaking and being attentive in discussions, as well as engaging actively in performance tasks (Proficient). On Emerging, 5.8% of the adolescents who are able to use technology with ease, compared to 13.9% of the adolescents who are not able to use technology, did not engage either by being attentive to discussion, speaking, or through action.

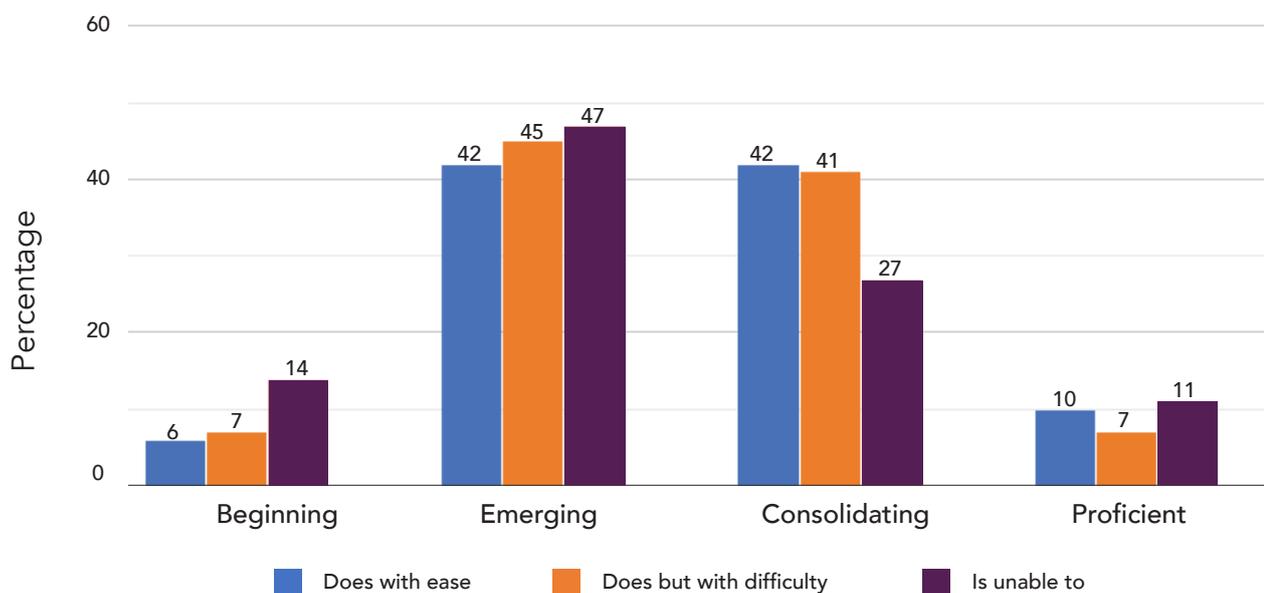


Figure 32: Collaboration Proficiencies of Adolescents by Digital Literacy Competence



Summary Of Collaboration

The Measurement

The collaboration tool comprises three tasks, which together contribute eight items. A task comprises a brief description of a situation, with each item targeting a different aspect of an adolescent's collaboration proficiency. All three tasks follow the same pattern, with their items targeting a 'step' approach to collaboration. The subskills assessed in collaboration are communication, negotiation, and working together.

The scales all demonstrate high reliability. All eight items also contribute robustly to the overarching skill of collaboration. Therefore, reporting results of the collaboration tool at the overarching construct is a reasonable approach.

The Results

The collaboration tool is effective for differentiating between adolescents in terms of their proficiencies. The tool can therefore capture indications of proficiency from very low levels to higher levels. The results provide information that could be used to begin the design of instructional programs to improve performance in each of the subskills of collaboration.

The results indicate that most adolescents are able to collaborate through speaking and being attentive in discussions as well as engaging actively in performance tasks. Only a few of them, however, can collaborate through taking positions and contributing ideas, prompting others, and being attentive to the input of others.

4.0 CONCLUSIONS AND IMPLICATIONS OF THE FINDINGS

ALiVE developed an assessment of three life skills and one value, creating a tool that gathered responses from adolescents to a variety of scenario-based and performance tasks. The open-ended responses of the adolescents were coded according to rubrics that allowed for evaluation of levels of quality in those responses. The coded data were then analysed according to their hypothesised contributions to overarching constructs, and in some cases to dimensions and subskills. The aim was to develop a measuring system that would generate information about what adolescents are able to do and how they perceive themselves and others around them in terms of self-awareness and respect. Scale reliabilities and person and item fit statistics calculated from the collected data support the validity of the assessment for its intended purpose. Given the comprehensive and systematic sampling, generalisability of the results can reasonably be claimed. The initiative demonstrates that robust and useful tools can be developed for use outside of the formal classroom space to generate data that is useful within that space.

The process of developing and using the assessment tool highlights several issues for consideration as East Africa continues to produce strategies and tools to collect data to be used as evidence of adolescent functioning across life skills and values. The results generated from adolescent responses to the assessment tool highlights an additional set of issues.

The development and use of the assessment tool was based on deep exploration of the constructs of interest, decision making about what aspects of these constructs could reasonably be measured, and a defined high-quality approach to the technical aspects of task creation and analysis of pilot and trial results to ensure robust scales. Future efforts to assess other skills, or to assess these same skills across other age groups, would be well advised to follow the same rigour of approach, with deep understanding of the actual constructs the foundation of decision making at the technical level.

The results show that most adolescents are not functioning at particularly high levels in the skills and the value assessed. This is an artefact of the expectations of the ALiVE test development team and the results obtained from the trial, from which sources the anticipated levels of performance were embedded in the tasks and their items. The maximal and minimal levels of performance set the possible range of performance. There are adolescents who perform at a very high level, indicating that such performance is definitely within the achievable range for the 13 to 17 year age group. Therefore, there is still much work to do in the education sector to bring more of this age group to higher levels of functioning. There are no existing 'standards' of performance set by the state or by the education systems for these skills and value. Therefore, future work should focus on determining reasonable aspirations for adolescents' performance, and these again must be embedded in the tasks to ensure that targeting of the assessments are accurate and appropriate.

In conclusion, the process of tool development and the results generated from that tool show us that we can assess life skills and values in the adolescent age group, and that those data hold lessons for how the education system can direct teaching interventions for East African adolescents.

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