Measuring Young People's Literacy and Numeracy Competencies Required in the Workplace and Everyday Life

Report of a Pilot Assessment in One District of Uganda

Uwezo Uganda (in partnership with Oxford Policy Management under the Strengthening Education Systems for Improved Learning Programme, Ministry of Education and Sports and the UK's Department for International Development)

Kampala, UGANDA, August 2020

uwezo UGANDA

Uwezo Uganda is supported by:

The UK's Department for International Development (DFID) under the Strengthening Education Systems for Improved Learning (SESIL) program

Wellspring Philanthropic Fund (WPF)

Twaweza East Africa

This assessment was funded by and implemented in partnership with Oxford Policy Management Limited under the SESIL program

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Recommended citation

Uwezo Uganda (2020) *Measuring Young People's Literacy and Numeracy Competencies Required in the Workplace and Everyday Life: Report of a Pilot Assessment in One District of Uganda. Kampala: Uwezo Uganda*


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Abbreviations

CAPI	Computer assisted personal interview
CACSA	Curriculum, Assessment and Certification Systems Architects
DC	District Coordinator
DFID	Department for International Development, UK
EA	Enumeration Area
HUYSLINCI	Huys Link Community Initiative
MoES	Ministry of Education and Sports, Uganda
OPML	Oxford Policy Management Limited
PIAAC	Programme for the International Assessment of Adult Competencies
SDG	Sustainable Development Goal
SEASAR	Strengthening Uganda's assessment and examinations system so that it is adaptive, responsive and self-improving
SESIL	Strengthening Educational Systems for Improved Learning
VC	Village Coordinator

Acknowledgements

In 2019, Uwezo in collaboration with Oxford Policy Management Limited (OPML) under the Strengthening Education Systems for Improved Learning (SESIL) programme supported by the UK's Department for International Development (DFID) and Uganda Ministry of Education and Sports (MoES) leveraged on Uwezo basic learning assessment methodology and infrastructure to develop and pilot an approach to measuring everyday functional adult reading, writing and math skills of young people. The focus of the pilot assessment was to develop and refine an approach of generating evidence to enable understanding of the long-term influence of school-based learning and other influences on adult functional reading, writing and mathematics.

We appreciate the support rendered by Aidan Eyakuze - the Executive Director of Twaweza East Africa, and other staff of Twaweza in undertaking this pilot assessment. We are grateful to Faridah Nassereka and Dr. Mary Goretti Nakabugo of Uwezo Uganda, who oversaw the assessment tools development, training, data collection and report writing. Other Uwezo staff, including Judith Nakayima, Ismail Sentamu, Judith Tumusiime and David Mugurusi supported the assessment process in various ways. A team from Oxford Policy Management Limited (OPML), including Kelly Casey, Zara Majeed, Joshua Wakabi, Rehemah Nabacwa, Dr Yusuf Nsubuga, Gabi Elte, Okey Ezike, and Jana Bischler supported the tools development, training of trainers and volunteers, deployment of computer-assisted personal interviewing (CAPI) and provided feedback on report drafts. Appreciation goes to the SESIL Senior Management Team, including Laura Garforth, Aggie Nakirya, Charlie Gordon, Dr Daniel Nkaada and Dr Akim Okuni, for reviewing the assessment design and tools.

We are grateful to Dr Reg Allen of Curriculum, Assessment and Certification Systems Architects (CACSA) for the technical support in the development and refinement of the assessment tasks. We thank Alisat Gule from the National Curriculum Development Centre and Joseph Kiggundu from Muteesa I Royal University for contributing to the development of the assessment tools. The assessment was partially modelled on the approach and tools that had been developed to assess everyday literacy and numeracy skills among young adults in Mozambique by MUVA - the UK Department for International Development (DFID) Mozambique's female economic empowerment programme, working with young women in urban areas.

Thanks to Assoc. Prof. Yovani A. Moses Lubaale for supporting data collection, processing, analysis and the pilot report writing process, and Dr. James Urwick for supporting the report editing and overall quality assurance. Mr Matovu Moses (Executive Director), Ahmed Kibirige (District Coordinator), Juliet Nansasi (Village Coordinator) and other staff of HUYSLINCI Community Initiative in Wakiso district coordinated all the assessment activities at district level, and we are most grateful for their support.

We are deeply indebted to the team of 20 volunteers who visited the households to assess the young people, to the heads of households for their cooperation and to the local council

leaders in the 10 enumeration areas (EAs) who facilitated an easy village level entry for this assessment.

We are grateful for the guidance we received from our 2019 National Advisory Committee members including Prof. Albert James Lutalo-Bosa, Mr James Muwonge, Mr Patrick Kaboyo, Dr Sarah N. Ssewanyana, Prof Joyce Ayikoru Asiimwe, Mrs Grace Kanyiginya Baguma, Dr Albert Byamugisha, Mr Baguma Filbert Bates, Dr Charles Tony Mukasa-Lusambu and Dr Ssekamatte Ssebuliba John.

Finally, we greatly appreciate the support we continue to receive from the Ministry of Education and Sports (MoES).

However, we take full responsibility for the contents of this report.

Uwezo Uganda

Foreword

For the past decade, Uwezo has assessed the basic literacy and numeracy skills of children of school age (ages 6-16), but we wish to understand better the situation of young people aged 14-20, many of whom have left school and others have transitioned to secondary and tertiary education, in relation to the demands of employment and every-day living for 'functional' literacy and numeracy. What levels of skill have they acquired in common uses of English and mathematics? What difficulties are they likely to face in the workplace with regard to understanding instructions, providing necessary information in writing, working with measurements and performing calculations?

The pilot assessment reported here, which is a collaboration between Uwezo Uganda and OPML under the SESIL program is a first step towards exploring these issues. It is intended to test and refine assessment procedures and approaches to analysis that could be used in a larger, more developed and more representative assessment exercise. The assessment method is one of using a series of contextually relevant performance tasks with restricted responses and, in each of these tasks, to obtain assessor ratings. Through complex, but flexible and adaptable processes of referral from one task to another, each individual assessed is placed on one of five levels in literacy and one of four levels of numeracy. The relationships of these outcomes to personal characteristics such as educational attainment and employment status are then considered. The processes and outcomes are presented in Section 3.

In Sections 4 and 5 of the report, the experience with the assessment method is reviewed. Both strengths and limitations are noted and possible ways of improving the method and the approach to sampling are mentioned. Some issues of analysis that emerge from the findings are also discussed. The evidence generated from the pilot though not generalisable reveals low functional abilities of young people in tasks related to reading, writing and mathematics. The findings reveal that majority of young people are categorized from lower to middle literacy and numeracy levels, an indication of low functional abilities. Overall, the pilot demonstrates that it is possible to objectively assess the functional learning outcomes of young people in literacy and numeracy that are required in the workplace and everyday life.

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Five Key Findings on young people's everyday and workplace literacy and numeracy competencies

1. Young people demonstrated varied skills on everyday and workplace literacy
   a. 4 out of every 10 young people assessed were at Level 3 (could read and interpret an official form and write a meaningful paragraph based on information provided).
   b. 3 out of every 10 young people assessed were at Pre-Reading Level 1 (could not identify common workplace signs and symbols).
   c. Less than 1 out of every 10 young people assessed attained the highest Reading Level 4 i.e. demonstrated conceptual understanding of unfamiliar texts.

2. Young people demonstrated low skills on everyday and workplace mathematics
   a. 2 out of every 10 young people assessed were at Numeracy Pre-Level 1 (could not recognise shapes, numbers, money, and place values)
   b. 6 out of every 10 young people assessed were at Numeracy Level 1 (could not go beyond recognition of shapes, numbers, money, and place values)
   c. Less than 1 out of every 10 young people assessed reached the highest level of numeracy i.e. complete workplace calculations with ease (Numeracy Level 3+)

3. Skill levels varied according to schooling status
   a. 5 out of every 10 out-of-school young people assessed were at Pre-Reading Level 1 compared to 2 out of every 10 in-school young people who were at Pre-Reading Level 1
   b. 4 out of every 10 out-of-school young people assessed were at Numeracy Pre-level 1 compared to 1 out of every 10 in-school young people at Numeracy Pre-Level 1

4. Skill levels varied according to levels of education completed
   a. Those with some primary education were more likely to be placed at Pre-Reading Level 1 (64% of those in P2-4 & 57% of those in P5-7) compared with those with some secondary education (10%).
   b. Those with some primary education were more likely to be placed at Numeracy Pre-Level 1 (50% of those in P2-4 & 31% of those in P5-7) compared with those with some secondary education (less than 10%).

5. Skill levels did not vary much by gender
   a. 3 out of every 10 girls and boys assessed were at Pre-Reading Level 1 (could not identify common workplace signs and symbols).
   b. 4 out of every 10 girls and 3 out of every 10 boys assessed attained either Reading Level 3 or 4 i.e. could read and interpret an official form and/or demonstrate conceptual understanding of unfamiliar texts.
   c. 2 out of every 10 girls and boys assessed were at Numeracy Pre-Level 1 (could not recognise shapes, numbers, money, and place values)
   d. Less than 1 out of every 10 girls and boys assessed could successfully complete workplace calculations (Numeracy Level 3+)


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Section 1

Introduction

1.1 Background to the young people's pilot assessment

In September 2015, at the United Nations Sustainable Development Summit, Member States formally adopted the 2030 Agenda for Sustainable Development. Seventeen goals including an education goal (Sustainable Development Goal 4) were agreed upon. SDG 4 focuses on 'ensuring inclusive and equitable quality education and promotion of lifelong learning opportunities for all'. It is crucial that skills gained from schooling make meaningful and lifelong impact both economically and socially.

While numerous studies have measured learning at basic level and revealed a global learning crisis outmatched by investments in education (e.g. Wane and Martin 2013; Uwezo 2017 & 2019; Bashir et al. 2018), the challenge has been in devising tools to accurately measure how outcomes of schooling match with those skills required in the workplace and everyday life. Given that few, if any, assessment methods and practices measure such skills in Uganda, Uwezo in collaboration with OPM and SESIL undertook to pilot an approach to assessment and measuring functional abilities of young people in reading, writing and math. The pilot assessment was partially modelled on the approach and tools developed to assess everyday literacy and numeracy skills among young adults in Mozambique that was implemented by MUVA - the UK Department for International Development (DFID) Mozambique's female economic empowerment programme, working with young women in urban areas (Allen, Bischler and Jasper 2018).

This collaborative pilot initiative leverages on Uwezo's basic assessment methodology of a citizen-led household-based survey to pilot an approach to assessing everyday and workplace skills in reading, writing and mathematics among young people aged 14-20 years (see Annex 1 for the pilot assessment design and standards developed for assessing these skills). The pilot assessment was designed to fit and feed into the government's ongoing programme to strengthen Uganda's assessment and examinations system from P1 to diploma level so that it is adaptive, responsive and self-improving (SEASAR). This partnership between Uganda's Ministry of Education and Sports (MoES), the UK's Department for International Development (DFID), Cambridge Education and Oxford Policy Management Limited (OPML), aims at pulling together key stakeholders in Uganda's assessment and examinations system to put in place a system that is self-improving, that uses the capacities of the different actors, and that focuses on measuring and promoting outcomes that are required in the world outside school.

The objectives of the pilot assessment of the functional reading, writing and math abilities of young people conducted in December 2019, were:

i) To develop an approach to assessment of, and setting standards for measuring, everyday young people's literacy and numeracy competencies, intended for use in a larger assessment that will contribute to knowledge of the long-term impact of school-based learning.
ii) To evaluate the assessment approach for its validity, reliability and relevance to the situation in Uganda.
iii) To provide preliminary evidence about young people's skill levels and their relationships with educational attainment and other factors.

Conducting the assessment of the functional abilities of young people will enable Uwezo to generate evidence crucial for understanding

the outcomes of schooling. Though not conducted with consideration of national or district representation, the pilot assessment has developed new measurement procedures for literacy and numeracy skills relevant to the workplace and to adult life. Additionally, it provides some useful preliminary evidence about the literacy and numeracy competencies of young people in everyday life and in the workplace.

1.2 Conceptual framework

The objectives of this study are informed by the general goals of Uwezo Uganda. We advocate an educational system which (1) develops human potential, both individual and collective, (2) contributes to livelihoods and prosperity and (3) is equitable in its accessibility and its impact on society. Many young people who have passed the age of compulsory school attendance have difficulty in meeting their basic needs or in entering occupations to which they aspire (OECD 2017a). They contend with structural disadvantages both within Uganda and in the wider global context.

In facing, and adapting to, the processes of globalisation, we seek cooperative action that prioritises the basic needs of people and the survival of the planet, rather than the competitive pursuit of wealth by corporate and political interest groups (Walters 2000, 197-200). Adult education and training remain a terrain contested between social goals and short-term market influences.

In the context of the increased provision of formal, basic education (primary and lower secondary) in low-income countries since the 1990s, a key issue is how far this basic education is able to contribute, in practice, to poverty reduction and diversified skills. Uwezo has for the past decade focused attention on some immediate learning outcomes of children in primary schools, but in the present study we consider learning outcomes over a somewhat longer period, among young people who have left school or are about to do

so. We are studying cohorts which typically entered primary school in the period from 2006 to 2013.

Using evidence from six developing countries, Palmer, Wedgwood and Hayman (2007) have argued that the impact of basic education on poverty depends both on the 'delivery context' for education in general and on the 'transformative context' that links education to the economy. They consider that both types of context depend on an effective system of post-basic education and training (PBET), in addition to basic education. In line with this argument, the framework of the present study will lead Uwezo to consider a wide set of influences. We cannot simply attribute low levels of literacy and numeracy among young people to the primary schools they attended. There are also questions about pre-primary and post-primary educational experiences and about access to secondary schools, training programmes and apprenticeships.

The traditional concept of 'adult and continuing education' covers a wide range of services, from adult basic literacy programmes to advanced technical and vocational training. Uganda has a Functional Adult Literacy programme, available in many districts, and various smaller non-formal education programmes aimed at young people. However, as we noted when reviewing progress towards achievement of the Dakar Goals, adult basic education has had a low priority in Uganda's public provision of education (Uwezo 2015, 23-24). Beyond basic education, Uganda has a range of institutions classified as providing 'business, technical and vocational education and training' (BTVET), with some opportunities for young people who have not reached school certificate level. But the BTVET sub-sector is relatively small. Non-degree outreach programmes offered by Uganda's universities do not benefit from much public funding and tend to be designed for employed people able to pay, rather than job seekers who lack qualifications (Openjuru 2011, 66-67).

The findings of the scaled-up study planned to take place in the first half of 2021, will be relevant, not only to issues of basic and post-basic educational opportunities, but also to issues of employment. Research by the Organisation for Economic Cooperation and Development (OECD 2017b) draws attention to youth entrepreneurship as a potential route out of poverty and recommends interventions that could contribute to successful outcomes for such activity. We can consider how far our findings support these recommendations and the implications for Uganda.

Section 2

Methodology

2.1 Introduction

The Uwezo household-based survey approach was adapted for use in the pilot assessment. The assessment targeted young people aged 14-20 in the selected households found in Wakiso District. The respondents were assessed on their functional abilities in oral reading, interpretation, writing and calculation. The assessment was based on everyday tasks that involve literacy and numeracy.

2.2 Sampling

Wakiso District was purposively selected to enable access to a wide variety of young people, including those in employment in both rural and urban contexts. Ten Enumeration Areas (EAs) were selected from the 2018 Uwezo sample for the assessment of children, for ease of entry at community level. The community leaders concerned were already aware of Uwezo's survey methods. Comprehensive listing of all households in the 10 EAs was done and, from the lists, households with young people in the target age group (age 14 to 20) were identified, out of which a selection of 20 households in each EA were selected, with the use of a table of random numbers. In total 200 households were sampled for the assessment as well as an additional five reserve households per EA. Accessibility gaps were expected because the assessment was scheduled within the Christmas season, during which household members are highly mobile. From each of the 200 households selected, the target was to assess a maximum of three eligible young people within the ages of 14-20 years found in a single household[1].

2.3 Response rate

The assessment targeted an estimated 200 households across the 10 EAs and up to three young adults in the 14-20 age group per household (40 per EA and 400 young people in total). The response rate for the households reached was 95.5% that is 191 out of the expected 200 households were reached.

Table 1 shows the number of households reached that had young people aged 14-20 years in each EA. From the household data, eligible respondents for the assessment per EA ranged from 26-43, with Lwadda A 'E' having the highest eligible respondents (43) and Wabiyinja 'A' the lowest number (26). Out of the eligible respondents, the actual respondents assessed were highest in Lwadda A 'E' (32), followed by Ttula 'N' at 31 while Namalyagonja 'C' had the lowest number at 19. As such, the response rate for the eligible people to be interviewed varied from 61.5% in Gganda 'A' to 88.5% in Wabiyinja 'A'. Instead of reaching out to an average of two young people per household as intended, we achieved an average of 1.3 per household. The timing of the assessment during the Christmas festive season could have affected the response rate at household level since some of the eligible young people could have travelled for the holidays. Nevertheless, the actual sample size is sufficient for the purposes of this pilot assessment, which is to develop an approach and tools to assessment of, and setting standards for measuring, functional young people's reading, writing and mathematics skills.

1 This criteria was included to cater for households which may have had more than three 3 eligible young people to avoid spending more time assessing in one household at the expense of getting a variety of households. Although three was set as the maximum number that could be assessed in a single household, sampled households with fewer than three eligible young people were included in the assessment.

Table 1: Sampling and response rates

Enumeration Area	Rural-Urban	Households targeted	Households in sample	Hh. response rate (%)	Av. household size	Youth aged 14-20 in households sampled	Youth assessed	Response Rate (%)	Av. eligible per hh.	Av. assessed per hh.
LWADDA A 'E'	Urban	20	20	100	7.1	43	32	74.4	2.2	1.6
NALYAMAGONJA 'C'	Urban	20	17	85.0	5.8	28	19	67.9	1.6	1.1
NAMULONDO 'E'	Urban	20	20	100	4.1	34	27	79.4	1.7	1.4
TTULA 'N'	Urban	20	19	95.0	6.5	38	31	81.6	2.0	1.6
KATOOKE B 'E'	Urban	20	19	95.0	5.1	36	24	66.7	1.9	1.3
BUKUNGULU 'A'	Rural	20	20	100	7.0	30	25	83.3	1.5	1.3
WABIYINJA 'A'	Rural	20	18	90.0	6.3	26	23	88.5	1.4	1.3
MUYOMBA 'A'	Rural	20	19	95.0	4.9	29	22	75.9	1.5	1.2
GGANDA 'A'	Rural	20	19	95.0	7.2	39	24	61.5	2.1	1.3
NAKUWADDE LUBANYI 'Q'	Rural	20	20	100	4.6	32	26	81.3	1.6	1.3
Total		200	191	95.5	5.8	335	253	75.5	1.8	1.3

2.4 Item development

The assessment focused on measuring workplace skills needed for successful participation in young people's everyday lives and the world of work. Tools and items to measure the functional abilities of the young people were developed by researchers from Uwezo Uganda, OPML, CACSA, an expert from the National Curriculum Development Centre and one academic from Muteesa I Royal University. This team developed and/or adapted from MUVA, five tasks in literacy (reading and writing) and three tasks in mathematics. For the reading and writing tasks, focus was placed on functional skills, including reading and interpreting workplace signs and symbols, public notices, reading and interpretation of official forms and writing with conceptual meaning. For the mathematical tasks, emphasis was placed on numerical skills required in everyday life and workplace, including the ability to deal with basic numbers, time and quantities as well as basic workplace calculations.

Specifically, the procedures for measuring reading, writing and mathematical skills involved the following tasks:

a) Reading and writing tasks:
   i) Completion in writing of a personal information form (Start Task)
   ii) Interpretation of workplace signs and symbols (LP12)
   iii) Reading and interpretation of public notices (L23)
   iv) Reading and interpretation of an official loan application form, and writing a meaningful paragraph based on information provided in the form (L3)
   v) Reading of two contrasting texts and writing of answers to show understanding of conceptual meaning in unfamiliar text (L4)

b) Mathematical tasks:
   i) Using basic numeracy skills such as recognition of shapes, putting numbers in order, recognising place value as well

as basic money values (NPL12)

ii) Working with time and quantities (N12)

iii) Basic workplace calculations (N23)

2.4.1 Pre-testing and revision of items

Once the assessment tasks had been developed, trialling of these was done in both rural and urban locations to test their validity and enable identification of elements not suitable or those that required adjustment. This was done over 2 days by item developers in 2 EAs and reached 47 respondents. In undertaking this activity, teams were tasked to take detailed observations of both the process as well as administration of the items in order for this to feed into the item revision process. An extract of emerging issues/feedback from the pre-test is shared below;

- Familiarity of enumerators with the items was identified as being crucial for training assessors how to identify when a person has gone far enough to allow a judgment
- Development of a CAPI user manual would help in navigating through the process and administration of the items
- Entry into households is crucial and calls for a need to have standard scripts to explain the activity to the family, to the interviewee and to any curious passers-by.
- Emphasis was needed by the volunteers to understand the process as a facilitative and supportive interview and the importance of relationship building e.g. the 'Start' task is an important part of establishing a supportive relationship with the interviewee –calling for paying careful attention to how the interviewee is handling this task
- Suggested changes for items and sub-items in L23 (public notice), N23 and LP12 (Signs) included editing of the instructions, reducing on the length of sub-items to avoid interviewee fatigue and the need for contextualisation of some items within LP12 - signs and symbols.
- Based on the pre- test results and reflections on the feedback, revisions to the developed items was done prior to the actual data collection. An item tracking tool developed to capture changes to each of the items or sub-items was filled and guided the discussions and decisions for further changes.

The final tasks used for the assessment can be accessed at the following link: https://twaweza.org/go/uwezo-learning-assessment-survey-tasks-2019

2.5 Training for the pilot assessment

2.5.1 Training of coordinators

Training of EA-level coordinators was done for four days by a team from Uwezo Uganda and OPML in order to train coordinators on how to manage the assessment. The trainees included Uwezo District Coordinator (DC) and two Village Coordinators (VCs) for Wakiso district. These would eventually later work together with Uwezo and OPML staff to train the volunteers who would do the actual assessment. Both theory and practice were embedded in the 4-day training, which included three days of theory (covering the assessment rationale, the assessment tasks, using CAPI and role-plays) and one day of field practice where each trainee got a chance of visiting at least two households and assessing at least two young people. Feedback from practice was further fed into the training of trainers' schedule as well as consecutive revision to the items developed for the assessment.

2.5.2 Training of volunteers

Uwezo works together with and through partners to undertake its household-based assessments. For the Young people's assessment of everyday reading, writing and math, Uwezo engaged Huyslink Community Initiative, the district partner for Wakiso district to support in pre-assessment activities including mobilisation, listing of households and recruitment of volunteers in the 10 EAs. A total of 20 volunteers were selected from each of the 10 EAs following a set of criteria. A call for volunteers was posted by the district partner in all sampled EAs, targeting graduates who were residents of these EAs, with fluency in English and the local language and who were of good morals and sound character (as recommended by the Area Local Council I Chairperson). To ensure the volunteers were well equipped to conduct the assessment, coordinators conducted four days of robust training with hands-on field practice. During the training, focus was also placed on how to conduct a social investigation research, understanding the flow charts, theoretically understanding the entire process and expected answers in each of the tasks, how to make a decision on the young person's demonstrated skills, as well as how to conduct CAPI for data collection.

2.6 Assessment procedure

The process of administering the assessment was an iterative, adaptive process using structured performance tasks where the volunteer kept adjusting the level of the task at each stage based on the information gathered about the young people's abilities in order to reach a decision guided by CAPI on a person's performance on the literacy and numeracy tasks with sufficient precision. Timing for some of the tasks was done during the assessment to ensure appropriateness of managing the tasks especially within the everyday context. For example, the young people had to complete the start task of filling in a personal information from within 10 minutes to be regarded as able to perform the task with ease.

The assessment approach required that when the young person was taken through a task, a level of support[2] appropriate to their needs was given, following which the volunteer would be guided by CAPI to make a decision about the young person's performance in the tasks and whether further tasks were to be given. Ultimately the volunteer would then follow the set of pre-determined decisions in CAPI to know whether for the reading/writing tasks the young person was at any one of the five literacy levels (from Level Pre-1 to Level 4) and one of 4 numeracy levels (from Level Pre-1 to Level 3). Sections 2.6.1 and 2.6.2 provide further details.

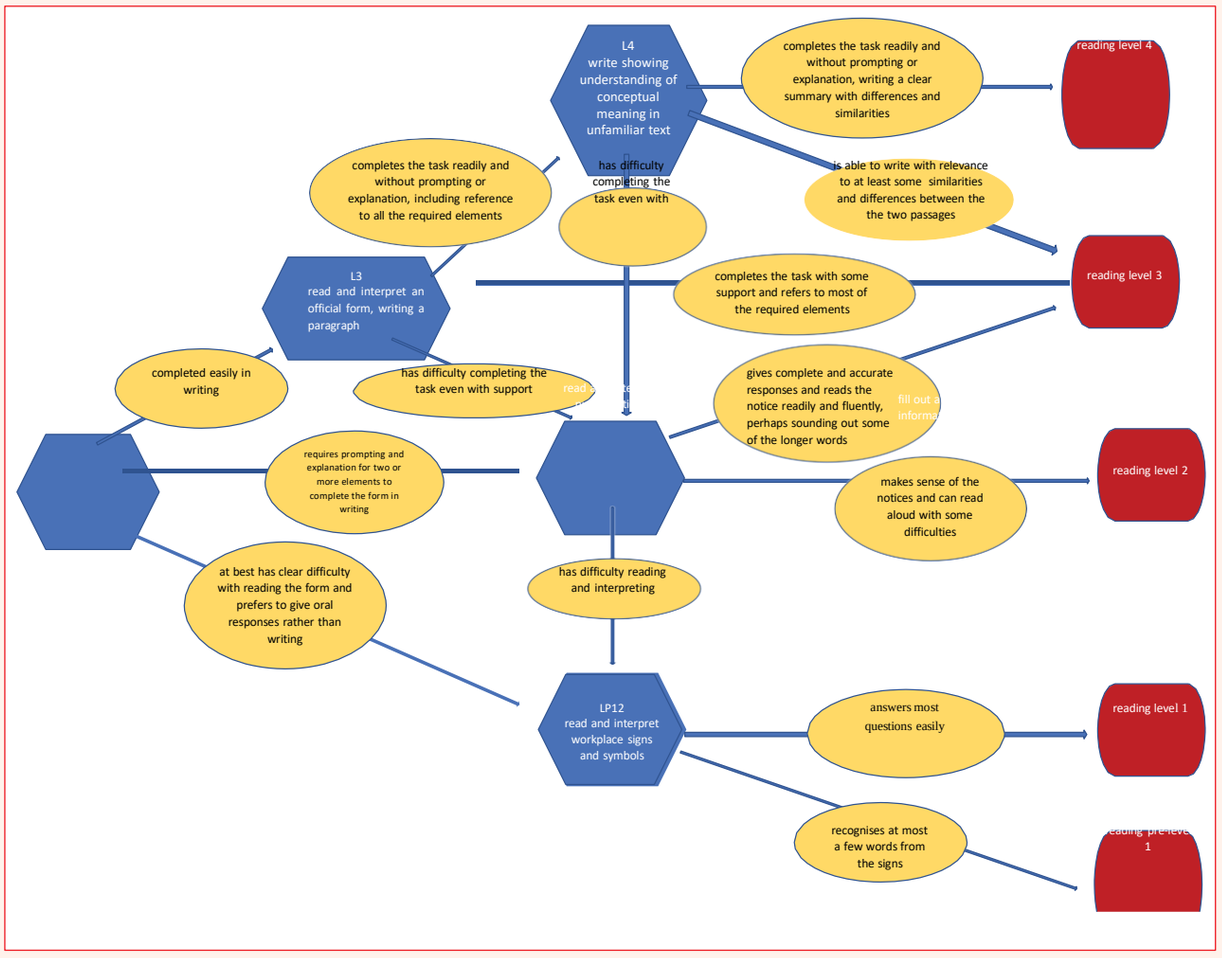
In the sequence of assessment, literacy tasks were administered before the numeracy tasks. The young people's literacy level was used as a starting point for the numeracy tasks, whereby the young person assessed would either be given higher or lower level tasks. The flow charts below (Figures 1 and 2) guided the administration of the reading, writing and mathematical tasks.

2.6.1 The literacy assessment flow chart and specification of skills by literacy level

Figure 1: Flow chart for assessing and grading young people's functional literacy skills, is a visual representation of the adaptive process we followed to make judgements and decisions on the young people's abilities to engage with everyday and workplace reading and writing tasks.

2 Throughout the training of coordinators and volunteers, a distinction (drawing from theory and through role-plays) was made between support and encouragement. It was important for the volunteers to understand that support and encouragement was different from telling the young person what the appropriate response was to a given task or doing the task for him or her. Rather it meant creating a supportive and encouraging environment for the young person to feel safe and confident to persist and complete the task.

Figure 1: Flow chart for assessing and grading young people's functional literacy skills



Using the different assessment tasks on filling a personal form, reading and interpreting workplace signs and symbols, reading and interpreting public notices, reading and interpreting an official form with writing and reading and writing showing understanding of conceptual meaning in unfamiliar text, judgement was made by the volunteer, as guided by CAPI, on the level at which the young person should be placed[3]. Table 2 below outlines the particular reading levels and the likelihood that the young people had competences required of that particular level of literacy:

3 For example, at the start task of filling a personal information form, any of the three judgements could be made on any young person completing the task: i) Completes all or almost all of the form easily and appropriately with little or no prompting or explanation >> go to L3 - completing an official form ii) Completes the majority of the fields but may need some additional prompting or explanation and/or took more than 10 minutes to complete the form >> go to L23 - reading a public notice c) Clear and significant difficulties understanding and filling in the form >> go to LP12 – identifying workplace signs

Table 2: Reading levels and required abilities

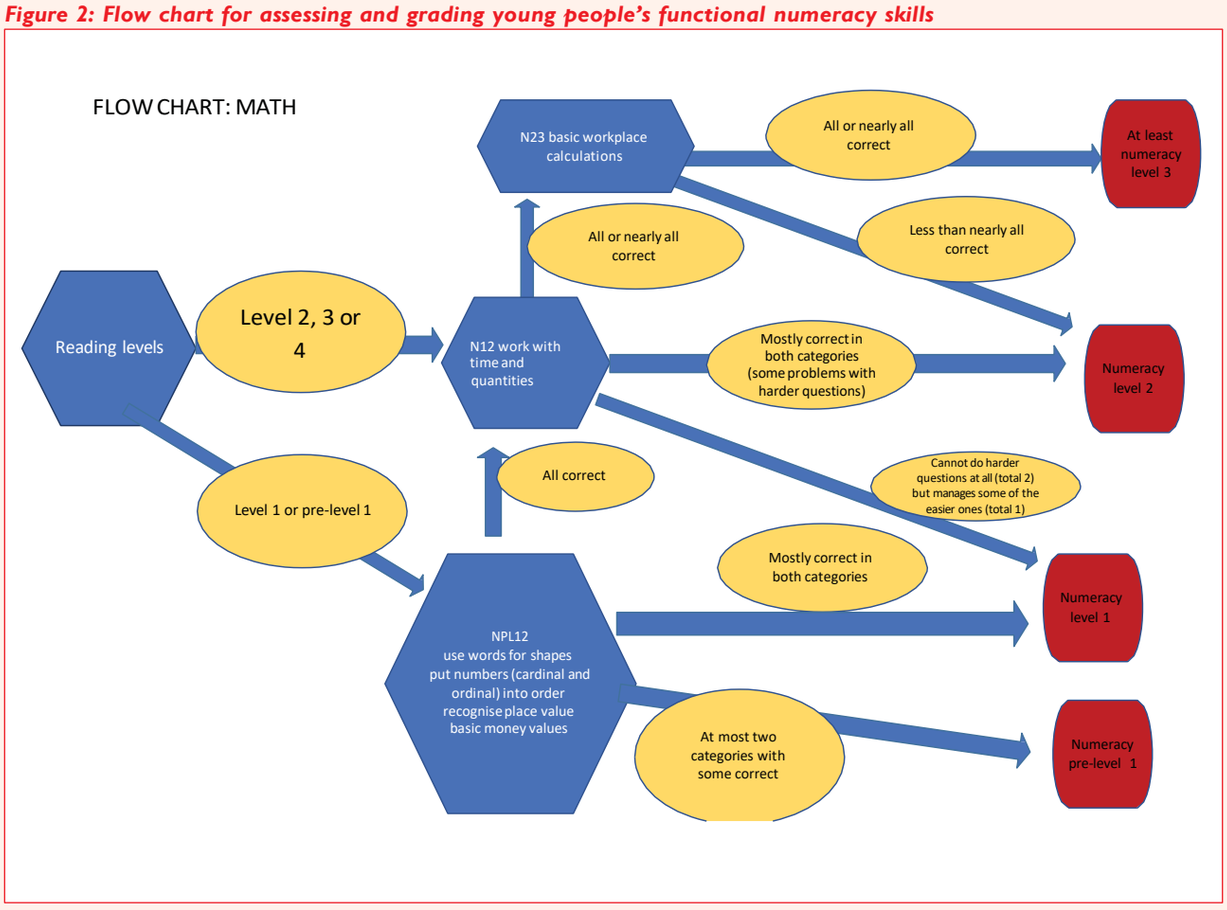
Reading Level	Demonstrated likelihood that a young person had competencies required for this reading level
Pre-level 1	a young person recognises a small number of very familiar whole words in print, recognises the meaning of some common signs and symbols supported by visuals, interprets/locates an extremely familiar piece of information in a short simple text
Level 1	a young person recognises high frequency words, common phrases, common signs and symbols; locates one or two pieces of information from a simple text (including SMS), diagram, table, reads word by word; sounds out letters/syllables to decode unfamiliar words
Level 2	a young person locates, selects and interprets information, identifies main ideas and can compare and contrast information from short, unambiguous texts, including simple non-linear texts, advertisements, tables, diagrams and application forms; reads by words and phrases, uses common patterns in language to identify unknown words
Level 3	a young person understands many types of familiar texts of moderate complexity requiring integration of ideas and pieces of information and some inference; reads familiar texts fluently, uses a range of strategies including cross-checks on syntactic and semantic sense to identify meaning of unknown words.
Level 4	a young person understands many types and lengths of familiar and unfamiliar complex texts involving abstract ideas, using inference and interpretation to identify the relationship between concepts and information; reads texts fluently with a broad range of strategies to understand complex unknown words and phrases.

2.6.2 The numeracy assessment flow chart and specification of skills by numeracy level

When assessing numeracy, the start was determined by the level at which the young person had been placed for the reading and writing tasks. Those who had performed lowest on the reading tasks were directly given lower level tasks for math while those at the medium and high levels in reading were given to start with medium level tasks in math. Based on how they performed on the beginning task, the young person would then be given higher or lower tasks that ranged from working out basic calculations, dealing with time and quantities and working with basic workplace calculations.

Figure 2: Flow chart for assessing and grading young people's functional numeracy skills: shows the sequence of tasks.

Figure 2: Flow chart for assessing and grading young people's functional numeracy skills



From the results of the various numeracy tasks, judgement was made by the volunteer on the level at which the young person should be placed. The abilities required are specified for each numeracy level in Table 3.

Table 3: Numeracy levels and required abilities

Numeracy Level	Demonstrated ability to be placed at this numeracy level
Pre-level 1	In extremely familiar contexts, a young person recognises whole numbers up to 10 including 0, may recognise whole numbers up to 100; recognises common notes and coins; may recognise oral ordinal numbers
Level 1	In highly familiar contexts a young person can use place value in whole numbers into 100s; add/subtract whole numbers and familiar monetary amounts; identify simple symbols and pictorial representations in highly familiar diagrams; use language of shape, size, colour such as straight, curved, square, circle, triangle
Level 2	In familiar contexts, a young person is able to work out time and quantities through identification, interpretation and use of · whole numbers, including numbers into the 1000s, money and simple, everyday fractions, decimals and percentages, e.g. 1/4, 1/10, 50%, 25% or 0.25 · dates and digital times · a limited range of familiar and predictable calculations with the four operations (+, –, x, ÷) with division and multiplication related to small whole number values
Level 3	Working with basic workplace calculations in a range of familiar contexts, a young person interprets, understands and uses · whole numbers and familiar or routine fractions, decimals and percentages · rates in familiar or routine situations · familiar and routine length, mass, volume/capacity and simple area measures in metric units · familiar and routine data, tables, graphs and charts, and common chance events · formal and informal symbolism relevant to the level. · fractions, decimals and percentages, including their equivalent values · statistical data in complex tables and spreadsheets, graphs, measures of central tendency, simple measures of spread and common chance

2.7 Data processing and management

The assessment was implemented via a CAPI programme designed by OPML using Survey Solutions, developed by the World Bank. Volunteers were trained on how to collect data using tablets and had hands-on field practice. All the data collected with the help of tablets was uploaded on a daily basis and errors identified for correction were pointed out to each volunteer in the form of an error log. Supervisors, allocated to each EA on a daily basis, supported and monitored the data collection process and guided the volunteers as a quality assurance measure.

Section 3

Findings

3.1 Introduction

This section of the report presents descriptive data on the households, the main outcomes of the various stages of assessment and some preliminary findings about young people's levels of functional literacy and numeracy. Some issues emerging from the findings are mentioned. Both the assessment process itself and the significance of the findings are discussed further in Section 4.

3.2 Household characteristics

Data were collected on household characteristics including household members' age, relationship to the household head, phone ownership and main language spoken at home as indicated in Table 4 below. The self-reported age of household members was used as an identifier for eligibility for the young people to be interviewed and assessed. As Table 1 has shown, 253 young people, located in 191 households, were actually assessed by the volunteers.

There were more females (55.7%) than males (44.3%) in the households reached. The proportion of household heads who were women was higher than in the general population of Uganda. This is probably due to the fact that Wakiso district is now increasingly becoming urban or peri-urban. Possession of a phone by the head of the household was high at 88.3%. Although the area is multi-ethnic, Luganda is the main language used in nearly all the households. Other local languages mentioned were Runyankole, Lusoga and Swahili and a few households mentioned use of English. An emerging issue is whether the use of local languages should be considered for the larger assessment, although a consideration of this will have major financial implications.

Table 4: Household characteristics

	MALE		FEMALE		Total	
	%	No.	%	No.	%	No.
Age group						
0-13	35.8	176	30.6	189	32.9	365
14-20	30.3	149	30.1	186	30.2	335
21-30	9.6	47	9.2	57	9.4	104
31-40	5.5	27	14.4	89	10.5	116
41-50	11.4	56	8.7	54	9.9	110
51-90	6.7	33	6.6	41	6.7	74
Not stated	0.6	3	0.3	2	0.5	5
	MALE		FEMALE		Total	
	%	No.	%	No.	%	No.
Main respondent in the household has a phone						
Yes	86.0	74	88.8	95	87.6	169
No	14.0	12	11.2	12	12.4	24
What is the main language spoken in the household						
Luganda	96.5	83	94.4	101	95.3	184
Other Local Language	2.3	2	4.7	5	3.6	7
English	1.2	1	0.9	1	1.0	2
Total	100	86	100		100	193

3.3 Findings from the personal information form

The start activity for every assessed young person (Literacy Task 1) required them to fill a personal information form provided. This required the respondent to read and fill in the name, sex, home address, date of birth, telephone number either for him/herself or for the parent or guardian, common language spoken at home, highest level of education, next of kin's name, address and phone number, and what the young person aspired to achieve in future.

Table 5 shows the results for this task and how they relate to socio-demographic characteristics. One-third of the respondents (32%) filled the form easily without help; the majority (46%) filled in the form after some level of support had been provided, while one in five (22%) had a lot of difficulties in filling the form. This implies that a large proportion of young people assessed (68%) struggled with reading and writing skills needed in everyday life.

There were slightly more females (33.1%) who completed the form correctly and with ease than male respondents (29.3%). However, the difference was not statistically significant. The proportion of young people who filled the startup form easily without requiring any kind of support increased with age up to a maximum of 47.1% among those aged 18 years and thereafter slightly dropped for the ages 19 and 20.
The data also reveals that young people without any form of disability performed better than those with any disability.

Young people who were currently unemployed performed better at filling the start-up task than the employed young people. However, where some form of support was provided in filling the form, the un-employed young people needed more support than the employed, which could be explained by the fact that employed young people may be engaging more with the practice of completing forms for various needs. However, the data available doesn't detail whether this applied for formal or informal employment.

Furthermore, ease in filling in the form was directly related to the level of education of the individual. Young people whose level of education was lower than primary five (59.1%) faced significant difficulty filling in the startup form (personal information form) while 1 out of 2 young people in the upper primary classes

5-7 had difficulty in filling the form. For young people with secondary or higher level of education, only one in twenty found it difficult filling in the startup form. The data further reveals that young people currently in school easily completed the startup form compared to those out of school. The finding may also be pointing to the difficulties the young people face in retaining and applying school knowledge to the world outside school.

Table 5: Level of achievement on the startup reading and writing exercise by characteristic of the respondent

	Completes the form easily and appropriately with little or no prompting or explanation (N=80)	Needed some additional prompting or explanation AND/ OR took more than 10 minutes (N=116)	Clear and significant difficulties understanding and filling in the form (N=57)	Total % (N=253)
Sex of the respondents				
Male	29.3	47.5	23.2	100.0
Female	33.1	44.8	22.1	100.0
Age of respondents				
14	23.5	54.4	22.1	100.0
15	23.3	55.8	20.9	100.0
16	31.3	46.9	21.9	100.0
17	35.7	28.6	35.7	100.0
18	47.1	41.2	11.8	100.0
19	39.3	32.1	28.6	100.0
20	35.0	45.0	20.0	100.0
Disability				
No disability	32.4	47.1	20.6	100.0
At least 1 type of disability	28.6	40.8	30.6	100.0
Employment status				
Student	34.2	49.5	16.3	100.0
Employed	23.3	36.7	40.0	100.0
Unemployed	25.6	35.9	38.5	100.0
Level of education				
P2-P4	22.7	18.2	59.1	100.0
P5-P7	4.5	44.8	50.7	100.0
S1-S4	40.3	54.7	5.0	100.0
S5+	69.6	26.1	4.3	100.0
Current school status				
In school	34.2	49.5	16.3	100.0
Out of school	24.6	36.2	39.1	100.0
Total	**31.6**	**45.9**	**22.5**	**100.0**

3.4 Determining young people's levels of functional literacy

Depending on how individuals performed on the startup task, i.e. completing a personal information form, decisions aided by CAPI were made on which additional tasks had to be given to the young people. Tasks at the lowest level (LP12) required interpretation of common workplace signs and symbols, those at the middle level (L23) required reading and interpreting of public notices and reading and interpreting an official form, including the writing of a short paragraph to indicate reasoning and understanding. Those who were more successful in the task of reading and interpreting an official form were given tasks on reading and comparing two contrasting texts and took short written tasks to show understanding of conceptual meaning (L4). Within each of those levels, a judgement was made to place the young people either at a low, medium or high competence rating.

The levels at which they were ultimately placed were:

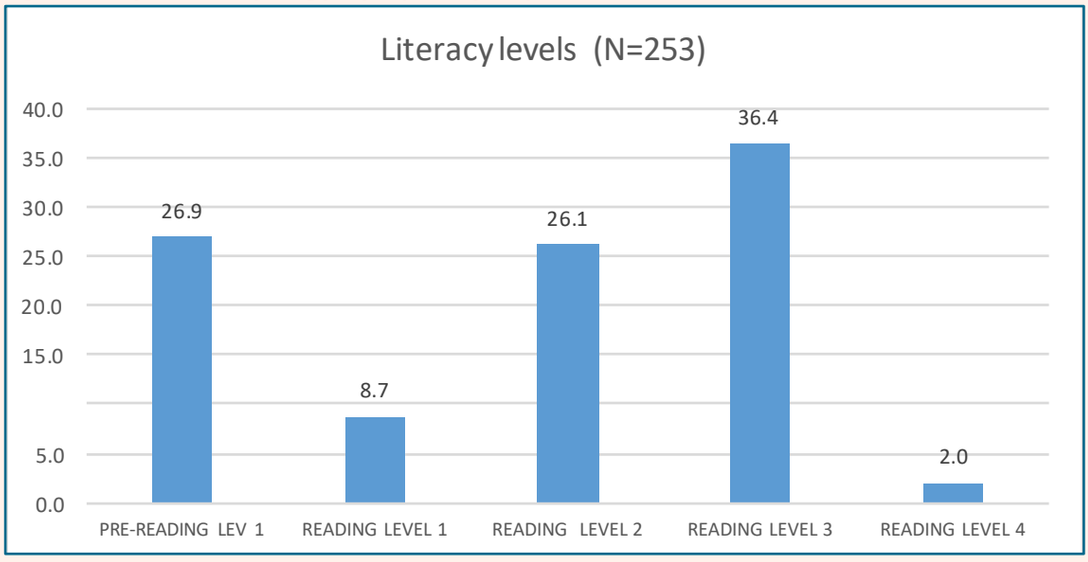
i) Literacy Pre-level 1, which is the ability to read and interpret a few workplace signs and symbols.
ii) Literacy Level 1, which is the ability to read and interpret most of the common workplace signs and symbols.
iii) Literacy Level 2, which is the ability to read and interpret public notices.
iv) Literacy Level 3, which is the ability to read and interpret an official form, writing a paragraph.
v) Literacy Level 4, which is the ability to read and write showing understanding of conceptual meaning in unfamiliar contexts

Table 6 and Figure 3 present the levels of competence on reading and writing tasks demonstrated by the assessed young people.

Table 6: Level of achievement on the various everyday reading and writing tasks

PERFORMANCE ON TASK	%	No.	Flow-chart destination
Filling a personal information form (Start)			
Completes all or almost all of the form easily and appropriately with little or no prompting or explanation	31.6	80	Official form task
Completes the majority of fields but may need some additional prompting or explanation AND/OR took more than 10 minutes to complete the form	45.8	116	Public notices task
Clear and significant difficulties understanding and filling in the form	22.5	57	Work signs task
Total (All)		253	
Read & interpret an official form (loan application) & write a paragraph (L3)			
Low [Answer contains none of the expected elements or makes no sense]	28.7	23	Public notices task
Medium [Includes some of the expected elements but lacking in clarity and/or depth]	30.0	24	Level L3
High [Elaborate and detailed, including all the expected elements]	41.3	33	Comparative texts task
Sub-Total (L3)		80	
Reads and writes showing understanding of conceptual meaning in unfamiliar text (comparative texts, L3 or 4)			
Low [Has difficulty completing the task even with support]	50.0	16	Public notices task
Medium [Completes the task, with perhaps some additional support and includes reference to some key points (at least one similarity and one difference in total]	34.4	12	Level L3
High [Completes the task readily and without prompting or explanation, writing at least 2-3 bullet points listing key (and correct) differences and 2-3 similarities]	15.6	5	Level L4
Sub-Total (L3 or 4)		33	
Read and interpret public notices (L2 or 3)			
Low [clear and significant difficulties reading and understanding (and gives 1-2 correct answers)	20.2	33	Work signs task
Medium [reads aloud with difficulty and gives correct answers to at least 3-5 of the questions]	40.5	66	Level L2
High [reads aloud without major difficulty and gives correct answers to all of the questions]	39.3	56	Level L3
Sub-Total (L2 or 3)		155	
Read and interpret work signs and symbols (LP12)			
Low [Significant difficulties reading and understanding]	75.6	68	Level LP
High [Answers at least 4 or 5 questions correctly and without hesitation]	24.4	22	Level L1
Sub-Total (LP12)		90	

Figure 3: Proportions of young people (14-20 years) at the different literacy levels



Those at Pre-level 1 (26.9%) could not even identify common workplace signs and symbols. Only 2% of the young people attained Literacy Level 4, demonstrating conceptual understanding of unfamiliar texts.

The literacy findings were further analysed in relation to the respondents' demographic and socio-economic characteristics: see Table 7. In this table, Levels L3 (completing an official form) and L4 (dealing with complex situations such as comparing information in two complex texts) are combined, given the small numbers of young people that attained Level L4 (2%).

Considering those who attained level 3 and 4 by sex, the data reveals that females performed slightly better than males on these more advanced tasks: but in other respects the differences are slight. It should be noted that there were more females (154) than males (99) in the assessment, which could have been a result of the timing of the survey which was conducted at household level, during holiday time. Young males in the targeted age group (14-20 years) tend to be more mobile than females as they look out for part-time work and help with family enterprises outside the home during holidays.

Educational differences are the main factors accounting for variations. Literacy levels increase with increased level of education and performance is affected by schooling status. Half of the young people not in school were placed at Pre-level L1. Those with some secondary education were much more likely to be placed at L2 (reading and understanding a public notice) or above than those with only some primary education.

Table 7 Relationship between everyday literacy and selected socio-demographic characteristics

	%Literacy pre-level 1 (N=68)	% Literacy Level 1 (N=22)	% Literacy Level 2 (N=66)	%Literacy Levels 3&4 (N=97)	Number
Sex					
Male	27.3	13.1	26.3	33.3	99
Female	26.6	5.8	26.0	41.6	154
Age					
14	25.0	11.8	27.9	35.3	68
15	27.9	7.0	27.9	37.2	43
16	28.1	6.3	12.5	53.1	32
17	35.7	10.7	28.6	25.0	28
18	20.6	2.9	26.5	50.0	34
19	17.9	14.3	35.7	32.1	28
20	40.0	5.0	20.0	35.0	20
Disability					
No disability	23.5	9.8	27.0	39.7	204
Disability	40.8	4.1	22.4	32.7	49
Employment status					
Student	17.9	9.2	28.3	44.6	184
Employed	46.7	10.9	23.3	20.0	30
Unemployed	53.8	5.1	17.9	23.1	39
Education level					
P2-P4	63.6	4.5	13.6	18.2	22
P5-P7	56.7	17.9	16.4	9.0	67
S1-S4	9.4	5.0	34.5	51.1	139
S5+	8.7	4.3	17.4	69.6	23
Schooling status					
In school	17.9	9.2	28.3	44.6	184
Out of school	50.7	7.2	20.3	21.7	69
Total	**26.9**	**8.7**	**26.1**	**38.3**	**253**

3.5 Determining young people's levels of functional numeracy

While assessing the young people's math abilities, the start task was dependent on the literacy level a young person achieved. Those who were at reading Pre-level 1 and Level 1 were started off with basic numerical recognition under Task 1 (ability to recognise shapes, numbers, money and place values) whereas those at the medium and high reading levels 2,3 & 4 were taken to tasks that required working out time and quantities (Task 2).

The young people were then either given one or more of the 3 tasks developed for the numeracy assessment after which a judgement was made on the level they were at (categorised as Pre-level N1, Level N1 (recognition of shapes, numbers, money and place values), Level N2 (time and quantities) or Level N3 plus (basic workplace calculations)). Table 8 below shows how their performances were rated at each stage and the destination of each group according to the flow-chart.

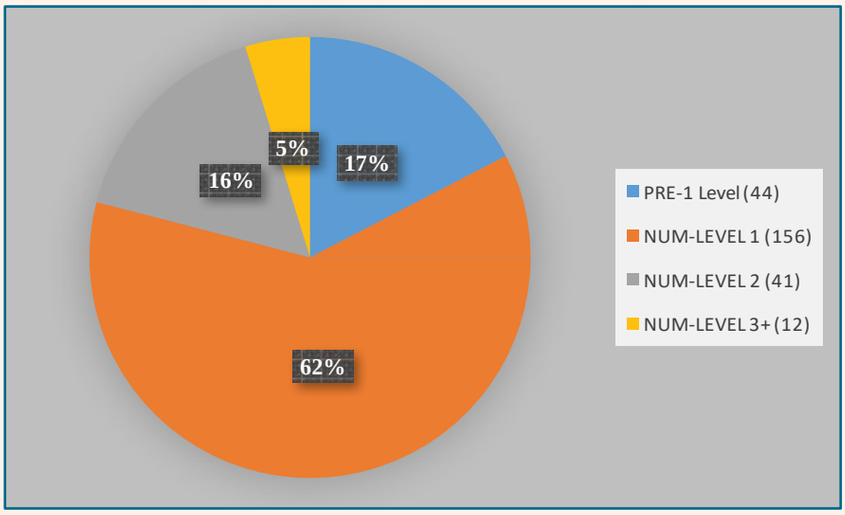
Table 8: Level of achievement on the various everyday numeracy tasks

PERFORMANCE ON TASK	%	No.	Flow-chart destination
Start-up for numeracy[4]			
Literacy Level Pre-1	26.9	68	Basic recognition (of shapes, numbers, place values, money values) task
Literacy Level 1	8.7	22	Basic recognition task
Literacy Level 2	26.1	66	Time & quantities task
Literacy Level 3	36.4	92	Time & quantities task
Literacy Level 4	2.0	5	Time & quantities task
Total		253	
Basic numerical recognition (NPL12)			
Low	47.8	43	Numeracy Pre-level 1
Medium	1.1	1	Numeracy level 1
High	51.1	46	Time & quantities task
Total		90	
Work with Time and quantities			
Low	74.6	156	Numeracy Level 1
Medium	12.0	25	Numeracy Level 2
High	13.4	28	Workplace calculations. task
Total		209	
Workplace calculation			
Low	57.1	16	Numeracy Level 2
High	42.9	12	Numeracy Level 3
Total		28	

4 The start task for numeracy depended on the literacy level at which a young person had been placed. However, irrespective of the startup numeracy task, the process was flexible and adaptable in such a way that the young person being assessed could progress to a higher or lower task depending on the demonstrated competency on the startup task.

The outcome of the numeracy assessment process was that 44 young people were placed at Numeracy Pre-level N1 (inability to recognise shapes, numbers, money and place values), 156 at Level N1 (recognition of shapes, numbers, money and place values), 41 at Level N2 (time and quantities) and 12 at Level 3 plus (workplace calculations). The percentages are shown in Figure 4 below.

Figure 4: Percentages of young people by assessed numeracy level



Performance on the various math tasks varied by socio-demographic characteristics, as shown in Table 9. A slightly larger proportion of females (5.2%) than of males (4%) were placed at the highest numeracy level (N3), but a smaller proportion at Level N2 (14.3% versus 19.2%), which required working on tasks with time and quantities.

Performance on numeracy tasks also varied with age. The highest proportion of young people who attained numeracy level 3 tasks were aged 18 years (14.7%) followed by those aged 20 years (10%). However, there were more young people aged 20 years (30%) who were categorized at numeracy pre-level 1, compared to other age groups.

Comparing the findings by employment status, the data indicates that (a) students (those in school) were less likely to be placed at level Pre-N1, but that there was little difference in performance between the employed and the unemployed. The class or grade which the young person had reached was also a major determinant of performance on numeracy tasks. None of those who had received primary education only were placed at Level N3. Almost all those who attained Level N3 had reached S5 or above, with a few in the S1-S4 category. As was the case with literacy, young people who were in school attained slightly better numeracy levels overall than their counterparts who were out of school.

Table 9: Relationship between Numeracy levels and selected socio-demographic characteristics

	% Num. Pre-Level 1	% Numeracy Level 1	% Numeracy Level 2	% Numeracy Level 3	Number
Sex of respondent					
Male	18.2	58.6	19.2	4.0	99
Female	16.9	63.6	14.3	5.2	154
Age of respondent					
14	5.9	83.8	8.8	1.5	68
15	25.6	65.1	7.0	2.3	43
16	15.6	50.0	31.3	3.1	32
17	21.4	60.7	14.3	3.6	28
18	17.6	38.2	29.4	14.7	34
19	21.4	53.6	21.4	3.6	28
20	30.0	50.0	10.0	10.0	20
Disability					
No disability	15.7	63.7	15.7	4.9	204
At least 1 disability	24.5	53.1	18.4	4.1	49
Employment status					
Student	8.7	67.4	19.0	4.9	184
Employed	43.3	46.7	6.7	3.3	30
Unemployed	38.5	46.2	10.3	5.1	39
Level of education					
P2-P4	50.0	45.5	4.5	0.0	22
P5-P7	31.3	65.7	3.0	0.0	67
S1-S4	5.8	69.1	20.9	4.3	139
S5+	8.7	26.1	39.1	26.1	23
Schooling Status					
In school	8.7	67.4	19.0	4.9	184
Out of school	40.6	46.4	8.7	4.3	69
Total	**17.4**	**61.7**	**16.2**	**4.7**	**253**

3.6 The relationship between literacy and numeracy levels

It is important to consider how far the literacy levels of young people, as assessed, predict their numeracy levels and vice versa. Some preliminary evidence on this relationship is provided by Table 10, which shows the frequencies by each combination of levels and the percentages of the grand total.

Table 10 Relationship between literacy and numeracy levels

Literacy levels:	Numeracy levels:				
	Pre-N1 (N=44)	N1 (156)	N2 (N=41)	N3+ (12)	Total (N=253)
Pre-L1 (N=68)	15.8	11.1	0.0	0.0	26.9
L1 (N=22)	1.6	6.4	0.8	0.0	8.7
L2 (N=66)	0.0	24.1	1.6	0.4	26.1
L3 (N=92)	0.0	19.4	13.1	3.2	36.4
L4 (N=5)	0.0	0.8	0.4	2	5.0
Total	**17.4**	**61.7**	**16.2**	**4.7**	**100.0**
	Gamma = 0.897; Rho = 0.676				

The largest clusters are those which combine L2 with N1 (24.1%), L3 with N1 (19.4%) and Pre-L1 with Pre-N1 (15.8%). In brief, the general level of numeracy is lower than that of literacy and, whereas placement at N2 or above predicts placement at L2 or above, the reverse does not apply. Most of those at L2 are at N1.

Below the table we show the values of Kruskall's gamma and Spearman's rho, both of which measure relationships between ordinal variables whose distributions are not necessarily normal. The gamma value of 0.897 shows a high level of predictability: but it should be borne in mind that the numeracy assessment used literacy levels as a starting point and so is not completely independent.

Intuitively we may feel that a basic level of literacy aids the comprehension and performance of numeracy tasks. But there is evidence that both literacy and numeracy skills are based on the same speech-recognition skills that are acquired in early childhood (Bulcock and Beebe 1981). Nevertheless, the ways in which numerical tasks are presented do vary in the demands they make on literacy; selecting the most appropriate methods of questioning is therefore one of the challenges of this assessment.

Section 4

Discussion of the method and findings and implications for scaling up the assessment

4.1 Reflections on the method

The various performance tasks used for the assessment are partly original and partly adapted, self-designed instruments. Partly for this reason, it is important to consider how consistently skills are rated through different tasks within the literacy and numeracy domains. Among the literacy tasks, there is a potential challenge of inconsistency between the official form (Literacy Task L3 and the comparative texts (Literacy Task L4). Out of 33 individuals referred from Task L3 to Task 4 (for a possible L3 or L4 placement), 16 (50%) were referred down to public notices (Literacy Task L23) for a possible reading level 2 placement. The other levels of potential inconsistency of ratings are much lower – 29% for Tasks LP12 and L23 and 21% for Tasks LP12 and L4 – and are, in practical terms, acceptable. Nevertheless, a small experiment to test inter-rater reliability, may be done in advance of the larger assessment planned to take place in the first half of 2021.

For Literacy Tasks L23 and L3, it may be desirable to carry out a content analysis in order to review and compare the cognitive levels and distinct skills that they require. This might result in a modification of content or a decision to refer moderate, as well as high, performers on Task 2 to Task 3. Basing the final placement on three, rather than two (or one) tasks would increase its reliability, although it would have implications for time and sample size, on which more will be said below.

4.2 Reflections on the limitations

The assessment design chosen for numeracy seems to require more refinement ahead of the planned scaled up assessment than literacy, for several reasons. Firstly, and though it was unintended, the literacy categories used as a starting point (L2 to L4 and LPre-1 to L1) were poor predictors of the numeracy placements. In particular, nearly all individuals placed at L2 were placed at N1 or below. Preferably, a specific numeracy task is needed as a starting point, partly because, in the existing design, some of the numeracy placements are based on only one numeracy task.

Secondly, the adaptable system of making judgements seemed less logical in the numeracy assessment. Logically, a task that is designed for the lower levels (Numeracy Task 2 on basic numerical recognition) should not be used to refer individuals to a higher level, as was the case. The system for literacy avoided this: compare the two flow charts, Figures 1 and 2. Overall, a general improvement of the numeracy assessment would be needed ahead of the larger assessment.

Survey solutions that was used for CAPI needed adaptation to the Uwezo household survey context to enable data collection from multiple respondents on one occasion. In the format used, data was collected from two points, i.e. household data and individual data, which needed to be linked by the volunteers. This necessitated that more time was taken within the household, lengthened data collection and had potential of contributing to respondent fatigue.

Consideration of sampling issues for the pilot and future studies now follows. The type of assessment used has implications for sampling because of the time required to assess an individual young person. In addition, the implications of uneven clustering were not considered sufficiently in the sampling design. Selection of one young person per household

would eliminate the problem of clustering at the household level and would also reduce household fatigue. Alternatively, a maximum of two individuals per household could be selected where available.

Because this type of assessment is more demanding than Uwezo's basic learning assessment of children, we should use a relatively small sample of young people in the larger assessment and aim at output of good quality. We do not need huge numbers to make judgements and draw recommendations. A revisit of the sampling at household and individual levels may be necessary given the time taken to assess the young people. A tradeoff on yielding expected targets at these levels may need to be thought through as well as agreement on a sampling approach that would be sufficient for representativeness of data at district and national level. The qualification and training needs for volunteers is also considerably higher for this type of assessment than in our past basic assessments of children, as the ratings depend more on their judgement. Their availability in sampled EAs is therefore likely to be more limited. We should be flexible to recruit volunteers from outside the sampled EAs in the planned larger assessment.

4.3 Reflections on the findings

The overall distribution of literacy levels, as determined in this pilot assessment, is bimodal, with the largest proportions at Literacy Level 3 (L3) (36%) and Pre-Literacy Leve 1 (27%). The distribution of numeracy levels, however, is unimodal, with the largest proportion at Numeracy Level 1 (N1) (62%), suggesting a more general failure of numeracy education. The implication of these statistics is that a large proportion of school leavers seem to remain 'unskilled' for employment purposes.

On the relationships between literacy and numeracy levels, on the one hand, and socio-demographic characteristics of the sample, on the other, as indicated in Tables 5, 6,7 and 8, the following comments are relevant:

1. Skill levels vary in the expected direction according to levels of education completed. However, we may in future need data on educational achievement (e.g. passes in the Primary School Leaving Examination), as well as attainment, and how literate the home environment is. In future, we may attempt a tracer assessment of some of those whom we assessed at the basic level.

2. Skill levels vary in the expected direction according to schooling status and, among the employment categories, students have higher levels of skill than those who are employed or unemployed. The employed have slightly higher levels of literacy than the unemployed, but their levels of numeracy are similar.

3. In the assessed EAs in Wakiso District, skill levels do not vary much by gender: but gender differences might be important in other parts of Uganda. For example, Uwezo's assessment of children has shown girls to have higher literacy levels than boys in parts of Southern Uganda.

In the planned larger assessment there will be scope for showing how skill levels relate to certain household and EA characteristics, as far as time and resources allow. It may not be necessary to obtain a complete age profile of household members (see Table 2), but a simple inventory of household possession, such as we have used in the basic learning assessments, would be useful for the measurement of socio-economic status in addition to the education status of household members, access to printed materials/aids as well as other variables linked to socio economic characteristics of households involved in the survey.

Section 5

Conclusions and Recommendations

5.1 Conclusion

The pilot assessment of young people's reading, writing and mathematical skills arose from the need to develop an approach to assessing the functionality of the everyday competences of young people. Consideration of the demands of the workplace and of daily living enabled us to develop and adapt relevant performance tasks for use in the assessment.

Possibilities of scaling up this kind of assessment were explored in order that nationally representative data is generated to illustrate the needs of the group and the outcomes of schooling. This pilot assessment has shown that the strategy used can provide relevant evidence, as shown in Section 3, although further refinements are needed to improve the reliability of the procedures, especially for numeracy.

The average number of young people aged 14-20 in household was less than 2. It is thus important that the future studies should plan for a maximum of 2 young adults per household on average.

The use of CAPI and the training provided for volunteers was in general effective and could be used more widely. The practice-based training and hands-on simulation with the flow charts helped volunteers to have a grasp of the assessment steps.

The evidence generated from the pilot though not generalisable reveals low functional abilities of young people in tasks related to reading, writing and mathematics. The findings reveal that a majority of young people are categorized from lower to middle literacy and numeracy levels, an indication of low functional abilities.

5.2 Critical observations and next steps

The following are some practical observations about the assessment process and comments on the next steps:

- CAPI as a data collection tool facilitated the assessment process and guided the volunteers appropriately through consecutive steps. The need for programming of the Survey Solutions application for suitability to household-based surveys is key as there was a lot of time taken in one household as data for the households had to be linked with that of individuals which in some cases brought about respondent fatigue. Further, the daily data entry logs show that in some cases individual data was collected that could not be linked to the household data. Future assessments will consider locally available programming options or open source tools such as KoBo[5] that enable merging of all data into one set of questions.

- As we have indicated in Section 4, a review of the sampling design will be necessary, partly because of the time taken to assess each individual through several performance tasks. The trade-off between sample size and data quality will need careful consideration as we plan to scale up the assessment.

- There is need to develop a startup task for numeracy to remove the ambiguity in thinking that a respondent was misplaced at startup for numeracy.

- More socio demographic and economic characteristics may be required to explain

5 https://www.kobotoolbox.org/

certain outcomes, for example, when an individual is employed, we may need to know the type of employment.

- For Uwezo assessments that are conducted at large scale, conducting this pilot assessment proved resource intensive even where fewer EAs in the district were selected. Scaling up the assessment using the Uwezo infrastructure and methodology will require operating within a reduced budget and lower costs. Costs per assessment could be reduced by engaging one volunteer per EA rather than two, but this would entail higher risks of non-response and uneven clusters at EA level. Overall, we should expect higher costs per assessment than those that have been experienced in the basic assessments of children.

- Finally, the findings of this pilot will be presented to, and discussed with, representatives of the Ministries of Education and Sports and of Gender, Labour and Social Development and SESIL Steering Committee. The purpose will be to get feedback on the refinements suggested on the assessment tools and on plans for scaling up the assessment to generate more representative data than was possible in the pilot.

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Annexes

Annex 1: Assessing everyday young people's reading, writing and math – pilot design and standards

Purpose

To develop an approach to assessing everyday reading, writing and math skills in young people (14-20 years of age) in Uganda, making a judgement about their functional abilities.

Pilot scope

- Location – Wakiso District
- Sample size – 20 Households in 10 enumeration areas, totaling 200 households. Estimating around 400 young people in the 14-20 age group. E.As from those previously visited by Uwezo during the 2018 basic learning assessment in the district shall be selected and existing EA maps will be used during the household listing exercise.
- Team – 20 enumerators (2 per E.A) and 5 trainers.
- CAPI Programming and training: Two days of programming and 1 day of training
- Pre-testing the tools using CAPI: Two days of pretesting
- Fieldwork training
- Fieldwork – three days of data collection during December school holidays
- Fieldwork model – teams of two (supervised and supported by the trainers and Uwezo staff as a quality assurance measure)

Analysis plan

How will the data be analysed?

Data will be analysed with a view to estimating the proportions of assessed young people at each reading, writing and math level.

Prior to the analysis OPM will support in the preliminary data cleaning and quality assurance of processes related to data management during data collection with support from an Uwezo staff.

What kind of analysis will be run?

Descriptive statistics will be run to permit presentation of the findings in form of percentages estimating the proportions of young adults at each level.

How is the data likely to be presented?

Simple, assessment, level-based reporting presented as graphs or tables with cross comparisons – supported with brief narratives. We also still hope the findings will enable us make general judgements on the longer-term outcomes of school-based learning and other factors influencing numeracy and literacy levels of young people, such as skills used in work and day-to-day living.

Standards for everyday adult reading (functional literacy) and mathematics

a. **Purpose**

Outline an approach to assessment and a set of standards

b. **How will we make decisions?**

A judgment about the standard of everyday adult reading (pre-level 1, level 1, level 2, level 3, level 4 or above) a person appears to have will be made by an enumerator based on oral interactions with the person about in-scope textual materials until the enumerator reaches a judgment that the person is at least at reading level 3 when written tasks may be used.

The process used is an iterative, adaptive process adjusting the level of task at each stage to the information gathered so far until enough information has been gathered to reach a decision about a person's standard of reading with a level of precision appropriate for the intended use of the data – a judgment that is more likely to be accurate than not (e.g. a person is judged to be at level 3 with about 30% probability that the person is 'really' at level 4 or 2).

The enumerator starts with a text at level 2 (see below), asking the person to read the first few sentences and respond to some questions/say something about the text. On the basis of the response to this first task, the enumerator will select further tasks at level 2, go to tasks at level 1 or pre-level 1, or go to tasks at level 3 or level 4.

c. **What are the standards?**

The following descriptions are brief overviews. Terms are explored below.

Enumerators will need to internalise[6] more detailed standards that we will need to develop in the Ugandan context (language, culture and workplace focus).

The requirements of the lower levels are not repeated in the summaries of the higher levels. Higher levels can be defined but it is expected that the frequency of their occurrence in the target population means that having them does not add sufficient value.

Pre-level 1: an adult recognises a small number of very familiar whole words in print, recognises the meaning of some common signs supported by visuals, locates an extremely familiar piece of information in a short simple text, recognises names of local places in a text.

Level 1: an adult recognises high frequency words, common phrases, common signs and symbols; locates one or two pieces of information from a simple text (including SMS), diagram, table, map or plan; reads word by word; sounds out letters/syllables to decode unfamiliar words

Level 2: an adult locates, selects and interprets information, identifies main ideas and can compare and contrast

6 Standards are internalised through a process where a group applies the standards to a range of instances until group members are sufficiently familiar with the ideas involved ithat they can apply the standards without recourse to a long list of detailed characteristics.

information from short, unambiguous texts, including simple non-linear web-based texts, advertisements, tables, diagrams and application forms; reads by words and phrases, uses common patterns in language to identify unknown words

Level 3: an adult understands many types of familiar texts of moderate complexity requiring integration of ideas and pieces of information and some inference; reads familiar texts fluently, uses a range of strategies including cross-checks on syntactic and semantic sense to identify meaning of unknown words.

Level 4: an adult understands many types and lengths of familiar and unfamiliar complex texts involving abstract ideas, using inference and interpretation to identify the relationship between concepts and information; reads texts fluently with a broad range of strategies to understand complex unknown words and phrases.

d. **Aspects of functional literacy in-scope**

reading

- transactional texts – communicating ideas and information
- continuous and non-continuous texts – includes signs, pictures and diagrams
- writing (for those at reading level 3 and above)

sources

- SMS
- web-page
- poster
- advertisements
- signs
- notices
- pamphlets
- maps
- tables
- newspaper articles
- instructions
- terms and conditions
- regulations

e. **Aspects of literacy out-scope**

note more creativity/poetry in local language

- expressive texts
- prose for personal pleasure
- fiction (novels and short stories)
- poetry
- creativity
- critical analysis

f. **A range of texts:**

Texts will range in terms of complexity and vocabulary.

g. **complexity**

Factors affecting complexity include familiarity of the content and context, sentence structure, length, unity of paragraphs, organisation within the text, overall sense of the text.

So, the range of texts will cover

- short, clearly written texts using familiar content and in familiar contexts with a focus on the concrete and immediate (close to the person and their situation) experience
- longer texts with less familiar content and contexts, including abstractions and experience that is more remote from the person and their situation

h. **vocabulary**

Vocabulary can range from a limited set of very familiar concrete terms to an extensive vocabulary and the capacity to identify the meanings of unknown words from their context

i. **Range of reading tasks**

i) **comprehension**

reading comprehension tasks can range from recognition of very familiar single words in a pictorial context through straightforward location and retrieval of information to comprehension that requires inferences across a text and integration of several pieces of information

ii) **decoding and fluency**

Reading aloud tasks can range from one or two words, through simple sentences to more complex paragraphs. The more complex reading tasks demonstrate the fluency needed to make connections between ideas/follow an argument in a complex text. The simpler reading tasks demonstrate explicit decoding strategies to make sense of unknown words.

j. **Comparison with OECD adult literacy skill levels**

The OECD Programme for the International Assessment of Adult Competencies assesses adults at five literacy levels (plus pre-level 1).

A summary of the first three of these levels plus pre-level 1 follows. The levels above allow for more differentiation at the lower levels. For example, level 4 above is similar to PIAAC level 3 and the pre-level 1 above is a lower level of functional literacy.

At PIAAC pre-level 1, adults can read brief texts on familiar topics and locate a single piece of specific information identical in form to information in the text

At PIAAC level 1, adults can read relatively short digital or print texts to locate a single piece of information that is identical to or synonymous with the information in the text. They have knowledge and skill in recognising basic vocabulary, determining the meaning of sentences, and reading paragraphs of text with at least moderate fluency.

At PIAAC level 2, adults can make matches between the text, either digital or printed, and information, and can paraphrase or make low-level inferences.

At PIAAC level 3, adults can read dense or lengthy texts with understanding, including of abstractions and can navigate complex digital texts.

k. **Everyday adult mathematics**

The requirements of the lower levels are not repeated in the summaries of the higher levels.

Pre-level 1: in extremely familiar contexts, an adult recognises whole numbers up to 10 including 0, may recognise whole numbers up to 100; recognises common notes and coins; recognises oral day markers (yesterday, today, tomorrow), relative position words (e.g. up, down); may recognise oral ordinal numbers from 1st to 3rd, digital time in hours and features of common 2D shapes: big, small, round, straight

Level 1: in highly familiar contexts an adult can

- use place value in whole numbers into 100s
- add/subtract whole numbers and familiar monetary amounts
- recognise and compare familiar basic metric measurements and quantities such as length, mass, capacity/volume, time, temperature, e.g. personal height and weight, a litre of milk or vehicle height clearances
- identify simple symbols and pictorial representations in highly familiar maps and diagrams
- use language of shape, size, colour such as straight, curved, square, circle, triangle
- use simple and informal symbolism

Level 2: in familiar contexts, an adult identifies, interprets and uses

- whole numbers, including numbers into the 1000s, money and simple, everyday fractions, decimals and percentages, e.g. 1/4, 1/10, 50%, 25% or 0.25
- dates and digital times
- common 2D shapes and some common 3D shapes, e.g. spheres or cubes;
- familiar and simple measures of length, mass, volume/capacity and temperature
- a limited range of familiar and predictable calculations with the four operations (+, –, x, ÷) with division and multiplication related to small whole number values
- mainly informal and some formal symbolism

Level 3: in a range of familiar contexts, an adult interprets, understands and uses

- whole numbers and familiar or routine fractions, decimals and percentages
- rates in familiar or routine situations
- familiar and routine 2D and 3D shapes, including pyramids and cylinders
- familiar and routine length, mass, volume/capacity, temperature and simple area measures in metric units
- familiar and routine maps[7] and plans
- familiar and routine data, tables, graphs and charts, and common chance events
- formal and informal symbolism relevant to the level.

Level 4: in unfamiliar and unpredictable contexts, an adult extracts, interprets understands and uses:

- fractions, decimals and percentages, including their equivalent values
- ratio, rates and proportions
- positive and negative numbers
- numbers expressed as powers, e.g. 2^3 or 3.6×10^3
- routine formulae and algebraic representations and conventions 2D and 3D shapes, including compound shapes

7 There is an argument that maps and directions (N, S, E, W) should not be included.

- detailed maps and plans
- statistical data in complex tables and spreadsheets, graphs, measures of central tendency, simple measures of spread and common chance
- mostly formal mathematical symbolism

I. **Comparison with PIAAC levels**

PIAAC Pre-level 1: carry out simple processes such as counting, sorting, performing basic arithmetic operations with whole numbers or money, or recognising common spatial representations in concrete, familiar contexts where the mathematical content is explicit with little or no text or distractors.

PIAAC Level 1: carry out basic mathematical processes in common, concrete contexts where the mathematical content is explicit with little text and minimal distractors. Tasks usually require one-step or simple processes involving counting, sorting, performing basic arithmetic operations, understanding simple per cents such as 50%, and locating and identifying elements of simple or common graphical or spatial representations.

PIAAC Level 2: can identify and act on mathematical information and ideas embedded in a range of common contexts where the mathematical content is fairly explicit or visual with relatively few distractors. Tasks tend to require the application of two or more steps or processes involving calculation with whole numbers and common decimals, per cents and fractions; simple measurement and spatial representation; estimation; and interpretation of relatively simple data and statistics in texts, tables and graphs.

PIAAC Level 3: can understand mathematical information that may be less explicit, embedded in contexts that are not always familiar and represented in more complex ways. Tasks require several steps and may involve the choice of problem-solving strategies and relevant processes. Tasks tend to require the application of number sense and spatial sense; recognising and working with mathematical relationships, patterns, and proportions expressed in verbal or numerical form; and interpretation and basic analysis of data and statistics in texts, tables and graphs.

PIAAC Level 4: can understand a broad range of mathematical information that may be complex, abstract or embedded in unfamiliar contexts. These tasks involve undertaking multiple steps and choosing relevant problem-solving strategies and processes. Tasks tend to require analysis and more complex reasoning about quantities and data; statistics and chance; spatial relationships; and change, proportions and formulas. Tasks at this level may also require understanding arguments or communicating well-reasoned explanations for answers or choices.

PIAAC Level 5: can understand and use complex representations and abstract and formal mathematical and statistical ideas, possibly embedded in complex texts. Respondents may have to integrate multiple types of mathematical information where considerable translation or interpretation is required; draw inferences; develop or work with mathematical arguments or models; and justify, evaluate and critically reflect upon solutions or choices