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TECHNICAL GUIDANCE

A Work Plan for Content Curation

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About this document

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Notes

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Contents

Background and purpose

In April 2020, Zanzibar's Ministry of Education and Vocational Training (MoEVT) and the World Bank approached EdTech Hub to request their support in implementing a Virtual Learning Environment (VLE). The engagement began with support for Phase 1, during which time the parties delivered 1) a feasibility assessment (↑Groeneveld, et al., 2020) on implementing a VLE in the region; 2) a guide on digital content curation (↑Groeneveld, et al., 2020); and 3) a short guide (↑Groeneveld, et al., 2020) on implementing a VLE in under-resourced environments. Following this initial phase, EdTech Hub began supporting Phase 2, during which the MoEVT aimed to start building its digital educational content base.

As part of the Phase 2 support, a work plan for curating digital content for Math Form 1 was developed. The work plan was designed to provide a detailed elaboration on the digital curation guide cited above. The plan was developed at the beginning of Phase 2 (December 2020) and was executed between December 2020 and March 2021.

This document, "A work plan for digital content curation", provides a global public good that can be used by any government or institution embarking on an extensive digital content curation project. While this document reflects the work plan designed and executed in Zanzibar, it has been refined based on the experience of implementing that plan. Timelines and guidance have been updated to reflect lessons learned throughout implementation. As such, this work plan is now a practical and hands-on step-by-step guide that can be adopted by any government or institution, and adapted to support content curation for any subject or grade level.

Timelines in this work plan are indicative of the time required to execute this process for the first time. This means the guidance is realistic, but longer than may be needed for other subjects and grades. The capacity and processes that emerge out of this first curation exercise lay the foundation for curating content for other subjects and grades, which are expected to move more quickly than the first subject.

Finally, a number of presentations have been designed during the process. These presentations may be helpful for future efforts. Links to these presentations have been added in Annex 1.

Implementation summary

Timeline for curating content for one subject of one grade

			Week								
Task	**Activity**	**Duration**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1	**Training, workshops & review sessions**	16-32 hours									
2	**Create a skills taxonomy**	1 week									
3	**Identify content**	2 weeks									
4	**Map content to taxonomy**	2 weeks									
5	**Adjust or create content**	3 weeks									
6	**Publish content as two products**	3 weeks									
7	**Test content**	3 weeks									
8	**Monitor content progress**	ongoing									

Resources used in the project

A number of resources were created to support the content curation process. These resources are a starting point, and can be refined by users as they see fit to ensure they are fit for purpose. Where relevant, these are outlined below as examples.

Resources

Resource #	Deliverable name	Related activity(ies)
R1	Workshop presentations (Annex 1)	1. Training, workshops and review sessions
R2	Taxonomy template (Annex 2)	2. Create a skills taxonomy
R3	Sample taxonomy (Annex 3)	2. Create a skills taxonomy
R4	Sample list with content repositories (Annex 4)	3. Identify content
R5	Safeguarding guidelines for engaging with students (Annex 5)	6. Test content

Workshops conducted in the project

The purpose of the process is two-fold: to curate appropriate content and for the ministry to build capacity and internalise a robust and scalable approach to content curation. Training, workshops and review sessions were provided where needed. Instead of having a few large training sessions, multiple shorter sessions of just-in-time training were delivered. Where needed, sessions were repeated and adjusted depending on the requirements at that point. Presentations of workshops that have been provided until this draft was prepared have been added to Annex 1.

Workshops

Workshop #	Deliverable name	Related activity
W1	Initial training on process and the skills taxonomy	1. Training, workshops and review sessions
W2	Review of the skills taxonomy and identification of content	2. Create a skills taxonomy 3. Identify content
W3	Review of skills taxonomy, content repositories and introduction to mapping content	2. Create a skills taxonomy 3. Identify content 4. Map content to taxonomy
W4	Monitoring and reporting. An introduction to progress tracking, reporting and user testing	4. Map content to taxonomy 7. Test content
W5		

Roles and responsibilities

This work plan assumes different roles and responsibilities. The table below provides a suggested role and responsibility distribution. In practice, however, there can be overlap between different roles. For example, a project manager can also be a consultant, or a content developer can be a subject matter expert. Besides, responsibilities can be assigned to different roles depending on their expertise.

Roles and responsibilities

Role name	Responsibilities
Project manager (PM)	The project manager is responsible for the overall project. They safeguard timelines and quality of outputs; report to stakeholders and intervene when the process runs into challenges.
Subject matter expert (SME)	A person with expertise on the contents and teaching of a

	specific grade and level.
Content developer (CD)	The content developer adjusts or creates digital content with guidance of the subject matter expert.
Monitoring & evaluation officer (M&E)	The M&E officer is responsible for tracking content, reporting on progress and setting up a testing procedure with learners
Information Technology officer (IT)	The IT officer supports the team where needed. For example, they establish collaborative online environments or co-design sheets.
Consultant	The consultant is an outside expert or group of experts guiding a government through the curation process and helping to build capacity. This can be any person or firm with experience on content curation, collaborating with the government.

1. Training, workshops & review sessions

Responsible	Consultant
Duration	4 days throughout
Resources	• Slides prepared for workshops • Taxonomy template (see Annex 2) • Sample taxonomy (example; see Annex 3)
Deliverables	• Initial training on skills taxonomy, existing content and mapping content • Review workshop on format and taxonomy • Review workshop on content requirements, existing content, content purposes and potential content • Review workshop on content mapping • Workshop on content changes • Workshop on testing approaches

After an initial training session on the skills taxonomy, selecting existing content and mapping content to the taxonomy, training workshops are provided on different activities. Rather than having a single, predefined training strategy, short just-in-time training is delivered on an activity or set of activities when it is needed. The duration of these training sessions is short and focused — normally one to two hours. When required, these were complemented by workshops, during which the consultants work with the government to undertake activities.

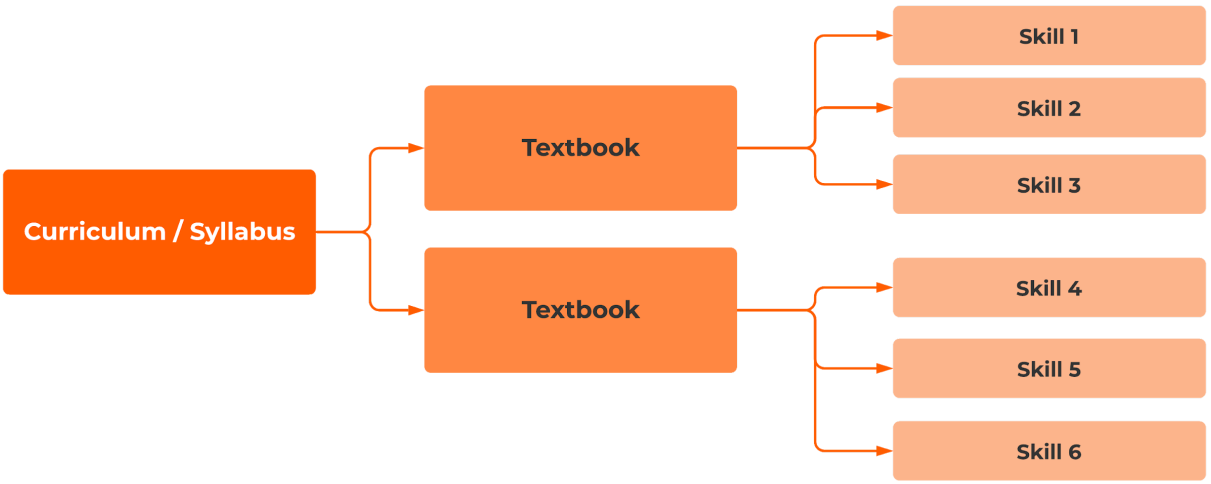
2. Create a skills taxonomy

A digital content curation or creation process starts with identifying which content is needed and where. This identification process relies on an analysis of curriculum for the learning objectives, and the actual textbooks and teacher experience for specific learning outcomes.

A curriculum is used to identify learning objectives and to structure the content in a coherent way that aligns with the needs of students and teachers. Often, the learning objectives in the curriculum are high-level and lack specificity. They guide the construction of textbooks. These textbooks, in turn, can be used to identify the actual learning outcomes that learners are expected to acquire. So, the curriculum provides a background framework, but the textbooks are used most intensively for the identification of the learning outcomes for which we need content.

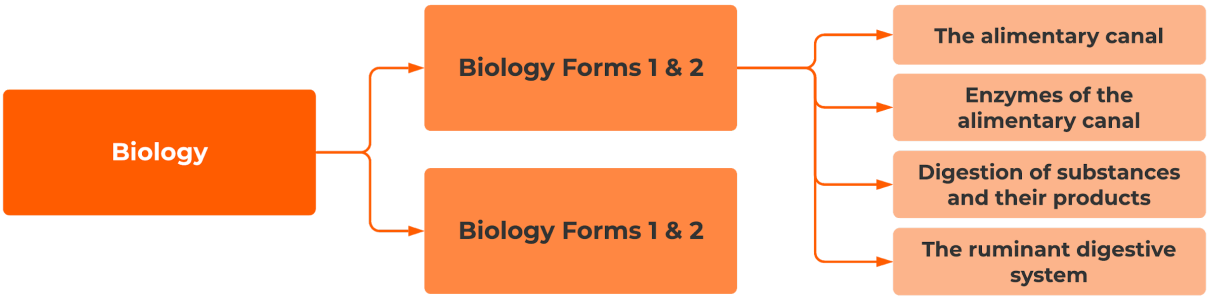
In the process of content curation or content creation, the specific learning outcomes or concepts that can be translated into one content item are called *skills*. A skill can contain one or several learning points: essential information that the content items need to contain. A content item that covers a skill can be a video, an audio fragment, a text or a simulation, while assessment questions are often added and tagged to that skill to assess understanding of that skill. A lesson in class typically encompasses one skill, but sometimes more than one skill is dealt with in one lesson. However, a skill rarely covers more than one lesson. If a skill cannot be taught in one lesson, we recommend splitting it up and creating skills with fewer learning points. In a schematic, the relationship between curriculum, textbooks and skills is illustrated as in Figure 1.

Figure 1. *Schematic representation of skills identification*



When we apply this approach to a subject, for example, *biology*, Form 2, the schematic becomes the one in Figure 2 where skills and their learning points have been identified.

Figure 2. *Skills identification of Biology, Form 2, Chapter 14: The Human Digestive System*



The skills taxonomy provides the framework to help identify which content is needed for a given subject in a given grade, and subsequently which actual content has been found and can be used. A well-organised skills taxonomy prepares the content curation process for scale: with ten grades and around 8 subjects per grade, the skills taxonomy allows all stakeholders to keep track of the process and helps identify which content is still needed and which content has been curated or created. A skills taxonomy template and sample can be found in Annex 2 and Annex 3.

Sub-activity 2.1. Create a format for the skills taxonomy

Responsible	Project manager
Duration	1 week
Resources	• Template (see Annex 2) • Sample taxonomy (example; see Annex 3)
Deliverables	• Skills taxonomy format (database or spreadsheet)

Description

The skills taxonomy is, in essence, a simple table that contains all that students need to learn. It is broken into their smaller units: skills.

Skills taxonomies can have the following requirements:

- The skills taxonomy must allow many several team members to work in the same file, database or spreadsheet
- The skills taxonomy must give unique identifiers (primary keys) to each identified skill, allowing it to link to other files where needed
- The skills taxonomy must be in a format that can be applied to other grades and multiple subjects

- The skills identified in the skills taxonomy can be linked to the curated content
- The skills taxonomy and the content that will be mapped can be used for reporting and monitoring purposes

In practice, a skills taxonomy is often a spreadsheet that will evolve over time, and may change in shape as it is being filled with content. A template is available, but the eventual format will depend on the needs of the user.

Within the skills taxonomy, there are several fields that should be maintained. An example of a taxonomy with the first five fields filled can be found in Annex 3:

1. **Unique Identifier**: This field is a short code that is unique to that skill. When the number of taxonomies (grades and subjects) grows, the unique identifier is a better way to refer to skills than using the skill name. Such a unique identifier can be compared with a social security number and used as a primary key: a code that always refers to that skill and is never reused. Such a unique identifier can be as simple as MF1S064 for Math, Form 1, skill 64. There are several important reasons to add unique identifiers, or codes, to skills:
    a. Skill names can change in time; skill names are relevant for students, not for the database; the codes remain the same when skill names change
    b. Skill names can contain typing errors, or people searching for a skill in a database may misspell a term; a code is short and arbitrary, but easy to find
    c. If there is a point where more information needs to be stored about a skill, for example in another sheet or database, the unique identifier is the primary key that can be used to link that information.
2. **Subject**: This is the subject for which the taxonomy is created, such as *English*, *mathematics*, *science* or *physics*.
3. **Topic**: This is the first step in the hierarchy. This can be a chapter name from the textbook, but it can be any logical name that identifies the topic best as in the example in Table 1.
4. **Subtopic**: This field is an organisational step between *topic* and *skill name* and gives the category where the actual skill falls.
5. **Skill name**: This is the skill name that students see. It should be short, preferably around 40-80 characters, self-evident and self-explanatory, and as short as it *can* be while being as long as it *must* be.
6. **Skill description / learning points:** This field helps the content curators and creators with specific information about the skill. For example, it can contain the method that is used for a division, the number of decimals in the approach, or specific learning points that should or should not be

included. Students do not see this field and if the Skill name is sufficient, this field can be left empty.

Table 1 provides an example of one skill. The *skill description* is not shown in this example.

Table 1. *Example of one skill in a skill taxonomy*

Identifier	Subject	Topic	Subtopic	Skill name
EF2S053	English	Parts of Speech	Nouns	Common and proper nouns

Sub-activity 2.2. Populate the skills taxonomy

Responsible	Subject matter expert
Duration	1 week
Deliverables	• Populated skills taxonomy

Description

Filling the taxonomy template with skills creates the actual taxonomy. The first time, a week is allocated for this activity. However, experienced subject matter experts need about half a day to a day to create a skills taxonomy for one subject per grade.

Depending on the content that will be found, skills may be split or merged on occasion.

3. Identify content

Once we have created a skills taxonomy, we can think about the format of content that we would like to curate or create. Do we think that a skill on *proper nouns* is best explained with a video? Do we prefer a simulation for a skill on creating a *graphic for a binomial equation*? Is an image the best format for a skill on the *parts of a tuber*?

Our content requirements can help us with the selection of content. While this is a useful exercise, for content curation the availability of content may override any stated content requirement or preference.

Sub-activity 3.1. Identify requirements for content

Responsible	Project manager
Duration	2 weeks
Resources	• Sample list with content repositories (see Annex 4)
Deliverables	• List of content requirements

Description

Understanding your content requirements is a crucial precursor to beginning to select content that aligns with the skills taxonomy. We can identify content properties that we prefer our content to have prior to selecting it.

The idea behind curating content separately from implementing a VLE is that content can be disseminated through different channels. Different channels or platforms that we use have different technical limitations and features that we should consider before we start selecting content. For example, if we use YouTube, this only allows for video, not for HTML-5 or textual content, nor is it possible to have assessment questions on YouTube. If we use a direct messaging channel in our implementation, then we have serious limitations on the file size, and PDF files do not display well on a phone screen.

These technical limitations or requirements go hand in hand with educational requirements. For example, a recorded lesson of 40 minutes may be less effective than an animated explainer video of 5 minutes. A 'talking head' may be less attractive than a voice-over. Or a quickly made video of a whiteboard is illegible, while a recorded presentation is.

Content requirements will evolve as content is found. However, having a clear list of content requirements makes the process of curating content easier and faster and the quality of the curated content more consistent.

Sub-activity 3.2. List existing potential repositories

Responsible	Project manager
Duration	2 weeks
Resources	• Sample list with content repositories (see Annex 4) • Safeguarding guidelines for engaging with students (Annex 5)
Deliverables	• List of existing content repositories

Description

There are many repositories with content. Some of these are good candidates to select content from, while others can be rejected quickly.

Finding potential sources for content is an activity where the input of teachers and especially students is particularly helpful. Engaging students helps identify which sources are currently used by the population in the country. Students can be engaged through a variety of methods, such as surveys, focus groups or a deeper engagement with a small panel of students.

The list or database of content repositories can include information such as:

- To what extent can the content be re-used and modified (what is the licence / can it be downloaded)?
- How many content items are there and in what format?
- What is the duration of a typical video; how many assessment questions are there for a typical skill?
- What is the format of a video? Is it animated, recorded?
- What is the quality of content (spelling and grammar for text; lighting, font or sound quality for video)
- Which subjects are covered?
- Which language(s) are available?

Sub-activity 3.3. Identify preferred content sources

Responsible	Project manager
Duration	2 weeks
Resources	• Sample list with content repositories (see Annex 4)
Deliverables	• List of preferred content repositories

Description

A thorough review of the list of potential content repositories based on the content requirements produces a list of preferred content repositories. This sub-activity delivers a number of content repositories that we will use as our

first source when we look for actual content. It is recommended to keep a record of all reviewed repositories, including the rejected ones, to prevent re-assessment when they are found again.

If we cannot find content in our selected repositories for a given skill, it is tempting to search for content on YouTube or google. However, there are practical reasons to stick to a list of content repositories:

- We have information on the copyrights of a given content repository
- We have assessed the general quality of content in that content repository
- Sticking to a limited number of repositories ensures there is a consistent style in the content items.

Instead, if a YouTube or google search yields new content, the content repository or content creator that created that content can be assessed and added to the list of content repositories.

This list contains content that matches the requirements, content, format, subjects etc. that were defined in the first sub-activity, and is the first place where SMEs will look when they search for content to curate.

4. Map content to taxonomy

Once a skills taxonomy is in place, the content selection process defined, and a list of preferred content sources identified, actual content can be selected and mapped to the skills in the taxonomy. While the activities below are listed distinctly, in practice this is an iterative process where content items from several sources are fit to the taxonomy. In this dynamic process, promising content sources may be dropped from the selection, while other content sources may be added again after review.

Sub-activity 4.1. Map content with taxonomy

Responsible	Subject matter expert
Duration	2 weeks
Resources	
Deliverables	• Taxonomy file with mapped content

Description

Depending on the skill, content can be selected immediately and mapped to a skill, or different candidate skills can be nominated that require further discussion or changes. An example of mapped content is provided in Table 2. In practice, the mapping of content items with skills can happen in the skills taxonomy directly, or in another sheet that is linked to the skill taxonomy with the unique identifier.

Table 2. *Content mapped to skills*

Identifier	Skill name	Repository	Mapped content
EF2S053	Common and proper nouns	Khan Academy	khanacademy.org/search?page_search_query=common%20and%20proper%20nouns

Sub-activity 4.2. First example of curated content

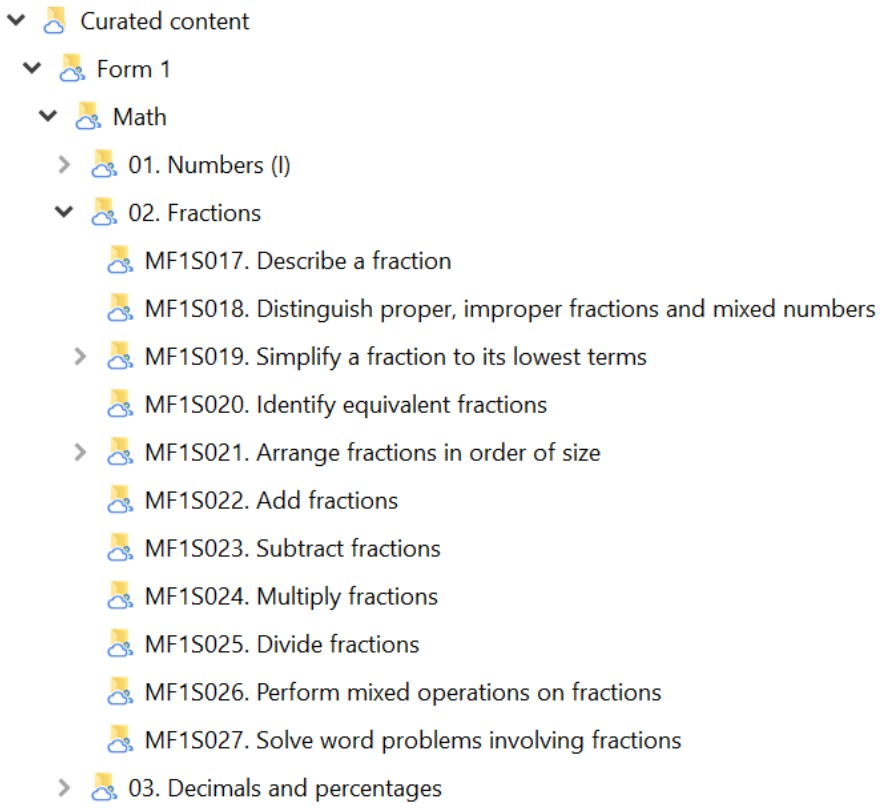
Responsible	Subject matter expert
Duration	2 weeks
Resources	
Deliverables	• First curated content items

Description

When the first content items have been mapped, for example for one or several chapters in the book, they can be made available and presented to the larger team for review. This can be done by downloading the content to a shared folder, or shared as links in a spreadsheet. Saving content in a shared location will allow the team to upload it to different VLEs at a later stage, or make it available to students. When content is saved to a folder, it is best to organise the content into folders that contain first the unique identifier and the skill name. The unique identifier does not change, but some skill names are adjusted at a later stage. In practice, colleagues and users search on skill names, but folders are most clearly ordered by the unique identifier. An example of a well-structured and robust file structure is found in Figure 3, based on the sample taxonomy provided in Annex 3.

Downloaded content is saved as video, as links, or in other formats that clearly identify the exact content.

Figure 3. *An example of a well-structured and robust file structure for saving content items*



Sub-activity 4.3. Progress report

Responsible	Monitoring & evaluation officer
Duration	3 days
Resources	

Deliverables
- Content curation progress report

Description

The skills taxonomy and the curated content should all be recorded in a database or spreadsheet. With the first curated and mapped content in place, the monitoring & evaluation officer can develop and populate the first progress report with required indicators

- Number of content items needed
- Number of content items planned
- Number of content items mapped
- Types of content items mapped
- Duration of curation period
- Progress of curation activity in percentage
- Subject(s)
- Form(s)
- Etc.

This first report will be more a proof of concept than very informative. It will show if and which information is missing in the taxonomy or mapping file. The format may change in the first months based on the input and needs of the different stakeholders. As the content base grows, the report will grow in size and in relevance for all stakeholders. The format of the progress report is also discussed in the section on monitoring.

5. Adjust or create content

Ideally, content is used as-is. Accepting that content is not a perfect but a good enough fit will have fastest results and build a curated content base most quickly. However, in some cases adjustments are necessary, or content deemed essential needs to be created. Still, this activity is optional and may not always be needed.

Sub-activity 5.1. Identify and make content changes

Responsible	Content developers
Duration	3 weeks
Resources	
Deliverables	• Curated content ready for use in Zanzibar

Description

Curated content sometimes needs changes. These can range from adding missing content, removing redundant information, adding a voice-over in the local language or subtitles, changing the pace of the content, et cetera. These changes are identified by SMEs, are carried out by Content Developers and reviewed and approved by the SMEs.

Sub-activity 5.2. Create missing essential content

Responsible	Content developers
Duration	3 weeks
Resources	
Deliverables	• Created content ready for use in Zanzibar

Description

When content cannot be curated but is deemed essential, it can be created. Creating content is labour intensive. The SMEs define the type of content needed, after which Content Developers collaborate with the SMEs to create the content. Content will then be reviewed by the SMEs. The SME who writes the script or creates the content should be different SME from the one who finally approves the content.

The length of this sub-activity is determined by the amount of content deemed essential and the format the content is created in. It is most time and cost effective to curate satisfactory content in the initial stages, and create only that essential content for which there is no acceptable candidate. When

there is time urgency, text formats containing the essential content are faster to create than video or interactive formats.

6. Publish content as two products

With a collection of content mapped to the curriculum, this content can now be made visible and concrete by packaging it in two different sample products. These products are not meant to be rolled out among students, but instead provide an example of how the curriculum-aligned content may look to the end user.

Sub-activity 6.1. Create file explorer product

Responsible	Information technology officer
Duration	3 weeks
Resources	VLE documentation
Deliverables	• File explorer alpha product

Description

The consultant(s) will work with the IT officer to upload the content into a suitable file structure. This will start after there is a high level of certainty the VLE product will be complete on time for testing.

Sub-activity 6.2. Create VLE alpha product

Responsible	Information technology officer
Duration	3 weeks
Resources	VLE documentation (↑Learning Equality, 2019)
Deliverables	• VLE alpha product

Description

The team can upload content into a suitable VLE. Since this step is intended to show an example of the content in a VLE, it is recommended to use either open source platforms or trial accounts. The team can also decide to upload a modest amount of content into several VLEs, to get a feel of how the content looks in different VLEs. However, please note that this step is only meant to assess the quality of the content in a VLE and show how that content looks for learners. This alpha product is not meant as a pilot of a VLE implementation or roll-out.

The process of uploading content can start simultaneously with the content mapping and content will be uploaded while the content mapping process progresses.

7. Test content

The purpose of testing content is to test assumptions on the content that has been curated, find out which content is most effective, gather opinions from end users and use their feedback to inform curation. This activity will be performed regularly, for example monthly, with the new content or new content options that are continuously added.

Sub-activity 7.1. Design testing protocol

Responsible	Monitoring & evaluation officer
Duration	1 week
Resources	• Safeguarding guidelines for engaging with students (Annex 5)
Deliverables	• Testing protocol

Description

The Monitoring & evaluation officer takes the lead in designing a testing protocol. The testing protocol describes how content will be tested with a representative sample of students and teachers. The content protocol contains a mix of methodologies to assess the quality of the curated content, such as focus group discussions, structured interviews, feedback sessions, but also includes assessment of student's understanding of the subjects after using the content. Table 3 provides an overview of which methods are suitable for which questions.

Table 3. *User testing methods*

	Focus groups	**Surveys**	**User observations**	**Assessment**	**Usage data**
What it does	Provides answers to questions you did not ask Can yield unanticipated results	Is structured Provides aesthetic preferences Provides information on legibility, pace, etc.	Show how students in reality engage with material, regardless of what they say	Shows if students understand the material Most useful if compared with a control group using the book	Shows which content students actually use Shows whether assessment scores correlate with content usage
What it does *not* do	Does not show effectiveness of content or if content will be used	Does not show effectiveness of content or if content will be used	Does not show effectiveness of content	Does not show if content is enjoyable or controversial	Does not provide evidence of causal relationships of content and learning outcomes

Setting up the logistics of user testing is a one time effort. Once set up, regular user testing can be conducted by interns at the same school and entered into a set reporting format to inform the curation team.

Sub-activity 7.2. Test students and teachers

Responsible	Monitoring & evaluation officer
Duration	1 week
Resources	• Safeguarding guidelines for engaging with students (Annex 4)
Deliverables	• Testing sessions

Description

The Monitoring & evaluation officer organises and conducts testing sessions with representative samples of users (students, teachers, etc.). These sessions are regular and use different methodologies, such as focus group discussions, surveys, observations and assessments, to gain a better understanding of how the curated content performs.

Sub-activity 7.3. Report on testing results

Responsible	Monitoring & evaluation officer
Duration	1 week
Resources	
Deliverables	• Report with test results

Description

The Monitoring & evaluation officer reports on the indicators defined in the testing protocol. Observations and conclusions in the report inform the PM and the SMEs on the approach taken. The curation team incorporates the results in their work.

8. Monitor content progress

This section proposes an approach to monitor the progress of the curated content. Monitoring an innovative process is essential to make it a success. Any innovative process — anything we do for the first time — runs into unanticipated challenges.

A recurring challenge in content creation and curation initiatives is the absence of information of how much content is needed, how much content has been curated or created, where content is missing, the type of that content, or the speed of content curation or creation. This work plan covers a two-month process of one subject of one grade, likely comprising around 100 skills. However, the purpose of the approach is to be ready for scale. This process can be applied to more subjects and more grades. If, for example, content curation is expanded to a total of four grades, the number of skills that need to be curated and saved are 100 × 4 × 4 = 1,600 skills. These skills, moreover, can exist in different stages: proposed, submitted for change, approved, et cetera.

The absence of a robust, consistent and systematic method of tracking curated content will quickly lead to a situation where the team loses awareness of the scope of work. To track progress it is most useful to have tools where team members collaborate within the same documents, with exactly the same format being used for different subjects or grades.

Sub-activity 8.1. Create a collaborative spreadsheet

Responsible	Project manager
Duration	1 week
Resources	
Deliverables	• A robust, collaborative spreadsheet template

Description

There are different software packages that allow online collaboration within the same spreadsheet, most popular among them Google Sheets and Office365. For regions with unreliable internet, software with synchronisation and collaboration capabilities, such as Dropbox, can be used. Creating copies of spreadsheets that different team members work on creates problems when the different spreadsheets are harmonised. Instead, all team members work in one sheet for a given subject and grade. This spreadsheet uses the same format for all skills taxonomies of the different subjects and grades and uses the data in them to fill dashboards. A consistent format for the taxonomy

sheets also makes training easier, usage of the spreadsheets predictable and reduces the risk of errors.

Within a spreadsheet, one team member is responsible for that file and assigns permissions. That person also safeguards the integrity of the spreadsheet.

Sub-activity 8.2. Create a dashboard or overview

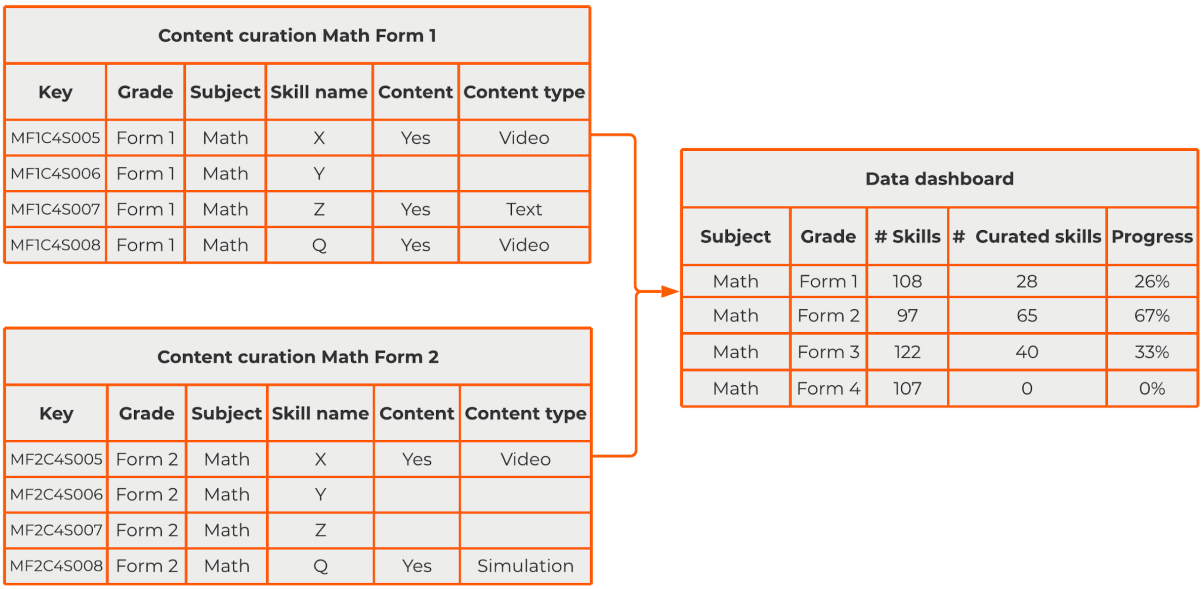
Responsible	Monitoring & evaluation officer
Duration	1 week
Resources	
Deliverables	• A dashboard or overview that tracks progress

Description

A single consistent format of the spreadsheet files across grades and subjects is both desired and necessary. It is desired, since a similar format allows the display of data in overview sheets, and can combine the data from different sheets in overview sheets. When the sheets are correctly filled and consistently maintained, data on the number of skills in a given taxonomy, the number of skills for which content has been curated, the formats of that content, et cetera, can be quickly seen. While this is a modest effort to set up once, progress data on any level defined is available immediately to any team member at any moment in the process.

A simplified example of such an automatic dashboard or view is shown in Figure 4.

Figure 4. *Simplified example of an automatic dashboard or view*



Content curation Math Form 1

Key	Grade	Subject	Skill name	Content	Content type
MF1C4S005	Form 1	Math	X	Yes	Video
MF1C4S006	Form 1	Math	Y		
MF1C4S007	Form 1	Math	Z	Yes	Text
MF1C4S008	Form 1	Math	Q	Yes	Video

Content curation Math Form 2

Key	Grade	Subject	Skill name	Content	Content type
MF2C4S005	Form 2	Math	X	Yes	Video
MF2C4S006	Form 2	Math	Y		
MF2C4S007	Form 2	Math	Z		
MF2C4S008	Form 2	Math	Q	Yes	Simulation

Data dashboard

Subject	Grade	# Skills	# Curated skills	Progress
Math	Form 1	108	28	26%
Math	Form 2	97	65	67%
Math	Form 3	122	40	33%
Math	Form 4	107	0	0%

Sub-activity 8.3. Create monthly progress report template

Responsible	Monitoring & evaluation officer
Duration	1 week
Resources	
Deliverables	• An actionable monthly report template

Description

A monthly monitoring report provides actionable information that allows the project management team to intervene when there are problems, reallocate resources when required, scale up the effort when possible, or take any other measures that are needed to get the process back on track. A monitoring report provides both a narrative and quantitative data on what is happening. The narrative part explains the numbers, provides background and clarifies the context. The quantitative part contains monthly target and production numbers and provides trend information compared with earlier months.

A monthly progress report should be as long as it must be and as short as it can be. It is best to design the format together with project management and other stakeholders who need to be kept informed. However, in the format only those numbers that are actionable — that is, that can be used to decide whether the project is on track or whether a course correction is needed — should be included. Limiting the monthly report to essential narrative and quantitative information makes it easier to maintain producing the report and for the target group to read.

9. References

Kaye, T., Groeneveld, C., & Bashir, A. (2020). Monitoring Distance Education: A Brief to Support Decision-Making in Bangladesh and Other Low- and Lower-Middle Income Countries (EdTech Hub Helpdesk Response No. 30). https://docs.edtechhub.org/lib/XUVA9827

Groeneveld, C., Kibga, E., & Kaye, T. (2020a). *Deploying an e-learning Environment in Zanzibar: Digital Content Curation*. EdTech Hub. https://docs.edtechhub.org/lib/T2W7MU3K

Groeneveld, C., Kibga, E., & Kaye, T. (2020b). *Deploying an e-Learning Environment in Zanzibar: Feasibility Assessment*. https://docs.edtechhub.org/lib/K7JDL4IL

Groeneveld, C., Kibga, E., & Kaye, T. (2020c). *Implementing a Virtual Learning Environment: A Short Guide for Zanzibar*. EdTech Hub. https://docs.edtechhub.org/lib/85C5HVC7

Learning Equality. (2019). *Kolibri Studio User Guide*. https://kolibri-studio.readthedocs.io/

Annex 1. Conducted workshops

Presentations were developed for the workshops. These presentations are works in progress, have been used once and have not been extensively reviewed on content or design. The presentations may be helpful in the design of future efforts.

- Workshop 1: Introduction to the process and to the skills taxonomy
- Workshop 2: Review of the skills taxonomy and identification of content
- Workshop 3: Review of skills taxonomy, content repositories and introduction to mapping content
- Workshop 4: Monitoring and reporting. An introduction to progress tracking, reporting and user testing
- Workshop 5: Challenges and issues with content mapping.

Annex 2. Taxonomy template

Unique identifier	Subject	Topic	Subtopic	Skill description	Necessary learning points

Annex 3. Sample taxonomy

The sample taxonomy below provides the first skills of 110 skills that have been identified for Mathematics in Form 1.

Unique identifier	Subject	Topic	Subtopic	Skill name
MF1S001	Math	Numbers (I)	Base ten numeration	Identify the place value in each digit in base ten numeration
MF1S002	Math	Numbers (I)	Base ten numeration	Read numbers in base ten numeration up to one billion
MF1S003	Math	Numbers (I)	Base ten numeration	Write numbers in base ten numeration up to one billion
MF1S004	Math		Base ten numeration	Apply numbers in daily life
MF1S005	Math	Numbers (I)	Natural and Whole Numbers	Distinguish between natural and whole numbers
MF1S006	Math	Numbers (I)	Natural and Whole Numbers	Identify even, odd and prime numbers
MF1S007	Math	Numbers (I)	Natural and Whole Numbers	Show even, odd and prime numbers on number line
MF1S008	Math	Numbers (I)	Natural and Whole Numbers	Find factors of a given numbers
MF1S009	Math	Numbers (I)	Natural and Whole Numbers	Use factors to find the greatest common factor (GCF) of numbers of two or more numbers
MF1S010	Math	Numbers (I)	Natural and Whole Numbers	Use factors or multiples to find the lowest common multiple (LCM)
MF1S011	Math	Numbers (I)	Integers	Identify integers
MF1S012	Math	Numbers (I)	Integers	Add integers
MF1S013	Math	Numbers (I)	Integers	Subtract integers
MF1S014	Math	Numbers (I)	Integers	Multiply integers
MF1S015	Math	Numbers (I)	Integers	Divide integers
MF1S016	Math	Numbers (I)	Integers	Perform mixed operations on integers
MF1S017	Math	Fractions	Proper, Improper and Mixed Numbers	Describe a fraction
MF1S018	Math	Fractions	Proper, Improper and Mixed Numbers	Distinguish proper, improper fractions and mixed numbers
MF1S019	Math	Fractions	Comparison of Fractions	Simplify a fraction to its lowest terms
MF1S020	Math	Fractions	Comparison of Fractions	Identify equivalent fractions
MF1S021	Math	Fractions	Comparison of Fractions	Arrange fractions in order of size

Annex 4. List of sample repositories

This list of sample content repositories has been taken from ↑Groeneveld, et al. (2020).

Table 4. *Global content repositories*

Source	Comments
Open Up Resources	**Target grades**: K-12 **Subjects**: Math and English **Format(s)**: Text and ready for print **Licences**: CC BY
Siyavula	**Target grades**: Grade 4-12 **Subjects**: Math and Science **Format(s)**: Textbooks **Licences**: Various CC licences
CK-12	**Target grades**: K–12 **Subjects**: All **Format(s)**: Multiple formats **Licences**: Various CC licences

Table 5. *Content repositories containing Swaihil content.*

Source	Comments
Khan Academy Swahili	**Target grades**: Secondary **Subjects**: Maths and science **Format(s)**: Videos **Licences**: CC NC SA BY
Ubongo kids	**Target grades**: Pre-K–Primary **Subjects**: English, Swahili, maths, science **Format(s)**: Videos (in Swahili) **Licences**: Proprietary
HaloStudy	**Target grades**: Secondary (Forms 1–4) **Subjects**: Maths and sciences **Format(s)**: Video and quizzes **Licences**: Proprietary (made by University of Dar es Salaam's Center for Virtual Learning
ShuleDirect	**Target grades**: Secondary (Forms 1–4); curriculum aligned with Tanzania **Subjects**: English, maths, science, history, geography **Format(s)**: Text, videos, quizzes **Licences**: Proprietary

Table 6. *Additional content repositories.*

Curriki	**Target grades**: All **Subjects**: All **Format(s)**: All **Licences**: Various CC licences depending on content item
Khan Academy	**Target grades**: K–12 **Subjects**: Maths and science **Format(s)**: Videos and online practice problems **Licences**: CC NC SA BY
Ted-ed	**Target grades**: Not curriculum-aligned; mostly secondary **Subjects**: Sciences and social sciences **Format(s)**: Video **Licences**: CC ND
PhET	**Target grades**: K–12 **Subjects**: Maths and science **Format(s)**: HTML5 simulations **Licences**: CC BY
Profuturo	**Target grades**: Secondary **Subjects**: All **Format(s)**: Full lessons including videos, available offline **Licences**: Proprietary
FuseSchool	**Target grades**: Secondary **Subjects**: Maths and science **Format(s)**: Videos **Licences**: CC BY NC
SplashLearn	**Target grades**: Pre-K to grade 5 **Subjects**: Maths **Format(s)**: HTML5 **Licences**: Proprietary
E-Learning for kids	**Target grades**: Primary **Subjects**: Maths and science **Format(s)**: videos **Licences**: CC NC ND BY
OER Commons	Not a repository, but a search engine for OER

Annex 5. Safeguarding guidelines

When working with students, international law and EdTech Hub guidelines describe how youth are protected, informed and empowered when they participate in co-designing learning solutions or as active participants in any process. These guidelines include, but are not limited to, the following:

- Gain informed consent from the student and from their parents/guardians as far as possible, and ideally also the 'gatekeepers'
- Pairing up (whether working in person or virtually) when working with the students
- Paying attention to the safety of any physical location students are asked to use
- Always obtain written consent for any photos, video or quotes
- Ensure that anyone who interacts with the students on on behalf of the government is aware of acceptable behaviour and the safeguarding policy

Below, a sample participant information sheet and a sample informed consent sheet are provided.

Sample participant information sheet

TITLE OF THE ACTIVITY: X

I would like to invite you to take part in a XXX.

Before you decide you need to understand why the activity is being done and what it would involve for you. Please take time to read the following information carefully. Ask questions if anything you read is not clear or if you would like more information. Take time to decide whether or not to take part.

WHO I AM AND WHAT THIS STUDY/ACTIVITY IS ABOUT

XXXXX [simple paragraph]

WHAT WILL TAKING PART INVOLVE?

XXXX [simple paragraph]

WHY HAVE YOU BEEN INVITED TO TAKE PART?

- ❏ You have been invited because the information about XXXX can only can only be gathered from people who XXXX
- ❏ You have been invited because you can give us valuable information and feedback about XXX
- ❏ (other options)

WHO SHOULD YOU CONTACT FOR FURTHER INFORMATION?

For further details, you can contact the research head who will explain the research and its purpose briefly.

Contact Details:

Name:

Email:

Mobile Phone #:

Sample activity informed consent form

Name of researcher or activity lead *(To be completed by the researcher/activity lead)*
Title of study or activity *(To be completed by the researcher/activity lead)*

Please read and complete this form carefully. If you are willing to participate in this activity, circle or mark the appropriate responses and sign and date the declaration at the end. If you do not understand anything and would like more information, please ask.

- "I have had the research satisfactorily explained to me in verbal and / or written form by the researcher. **YES / NO**
- I understand that the research will involve: *(interview and the time involved e.g. 45 mins)* **YES / NO**
- I understand that I may withdraw from this study at any time without having to give an explanation. **YES / NO**
- Do you want to be named in any written work arising from this study? **YES / NO**
- I understand that any audiotape material of me will be used solely for research purposes and will be kept safe. **YES / NO**

I freely give my consent to participate in this research study and have been given a copy of this form for my own information."

Signature: .....

Date: .....