Instructional Alignment in Nepal Using the Surveys of Enacted Curriculum

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Key Points

- The content coverage of the Integrated Curriculum for Nepali Language Arts and Reading is broad, but some topics, including foundational reading and writing skills, are emphasised more than others.

- The Integrated Curriculum generally emphasises middle levels of cognitive demand.

- Integrated Curriculum content is highly aligned across Grades 1-3.

- Grade 1 teachers cover Integrated Curriculum topics more broadly, and typically at lower cognitive demand levels, than the curriculum prescribes.

- The Classroom-Based Early Grade Reading Assessment (CB-EGRA) focuses on a narrower set of skills than either the curriculum or instruction, and typically at higher cognitive demand levels.

- Student performance on the CB-EGRA is low, suggesting the need for greater support on specific topics and at more basic skill levels so students have a stronger foundation for future progress.

Introduction

In recent years, the Government of Nepal (GoN) has undertaken significant efforts to support children and teachers and improve literacy outcomes in the early primary school grades. As part of this effort, the GoN developed and implemented a new Integrated Curriculum, which was introduced beginning in 2019. Through the Early Grade Reading Program (EGRP) and Early Grade Reading Program II (EGRP II), implemented by RTI International, USAID provided technical assistance on incorporation of best practices in the curriculum.

Critical to the effectiveness of any new curriculum is ensuring it is well structured and aligned with the needs of learners in the classroom, and that teachers are adequately trained and supported so that their instruction aligns with the intended content. In other words, it is important that the prescribed curriculum and taught curriculum are well aligned with each other and well aligned with children's needs.

Recent evidence has shown that misalignment of curriculum, instruction, and children's learning levels is common, and that improved alignment can improve learning achievement. For example, overambitious curriculum, in which the pace of the curriculum is too fast or covers too much content for most children to keep up, is common (Beatty and Pritchett, 2015; Kaffenberger and Pritchett, 2021). There is evidence that slowing the pace of curriculum content and better aligning with children's learning levels can improve outcomes, as evidenced from major curriculum reforms and programmes such as Teaching at the Right Level and Structured Pedagogy approaches (Rodriguez-Segura and Mbiti, 2022; Hwa et al., 2020; Piper et al., 2018).

The Surveys of Enacted Curriculum is a methodology that systematically analyses and quantifies the content and alignment of instructional components such as curriculum, assessments, and teacher instruction. The approach has been used over the last 25 years in the United States to measure alignment of curriculum with national standards and to support teacher instruction and professional development.[1]

More recently, it has been applied in East Africa, specifically Tanzania, Uganda, and Kenya, to identify instructional alignment and misalignment. In Tanzania and Uganda, for instance, an SEC study found that national curriculum standards, primary leaving exams, and teacher instruction varied widely in their focus and content coverage. While exams were tightly focused on a narrow set of content, teacher instruction broadly covered a full suite of topics, and neither was highly aligned with the curriculum standards (Atuhurra and Kaffenberger, 2022).

In this context, the RISE Programme partnered with the GoN, USAID, and RTI on an operational research study, using the Surveys of Enacted Curriculum to examine the content and alignment of the new curriculum with teachers' classroom instruction and children's learning levels, as measured on associated early grade reading assessments. The alignment analysis reveals the extent to which teacher instruction is aligned with the new curriculum, enabling the GoN to identify teacher support needs and guide plans for supporting the effective implementation of the curriculum. It also reveals the extent to which curriculum standards are aligned with children's learning levels, identifying any areas where alignment could be improved.

The study finds that the new Integrated Curriculum (IC) covers the five foundational reading skills (i.e., phonemic awareness, phonics, vocabulary, comprehension, and fluency [Comings, 2014; National Reading Panel, 2000]) throughout the first three grades of primary school, with most of these topics covered at low- to mid-levels of cognitive demand. This should present a strong initial opportunity for children to gain reading proficiency. Furthermore, Grade 1 teacher instruction is highly aligned with the IC (at 0.63 on a zero to one scale), indicating coverage of the core topics.

Both the IC and teacher instruction also cover broad sets of topics, often touching on all topical areas in a single grade. However, teachers tend to spread their coverage more widely and evenly across topics than the IC, not following the peaks of emphasis prescribed in the IC. This may prevent children from gaining the depth of understanding needed for mastery. The content maps for teacher instruction suggest an opportunity to examine why teachers are spreading their instruction so thinly, and how teachers could be supported to better emphasise those topics emphasised in the IC.

Both the IC and teachers' instruction emphasise low and middle levels of cognitive demand. Little emphasis is given to the top levels of cognitive demand, which require deeper understanding and application of skill.

There is high alignment of the prescribed curriculum from one grade to the next, prescribing very similar content coverage from grades 1 to 3. While this could indicate a spiral pattern, in which content is covered initially and then returned to for review and greater depth, it could also indicate unnecessary repetition of coverage. Further examination of the content overlap across grades could identify opportunities to streamline the curriculum, and ensure both appropriate levels of repetition (such as for review of content) and adequate depth for the priority areas in each grade.

The classroom-based early grade reading assessment (CB-EGRA), intended for use by teachers to understand learning levels of the children in their classroom, covers a narrower set of topics at somewhat different levels of cognitive demand than the IC. This narrow coverage leaves teachers without information on student performance for many of the topics they are expected to cover, creating an opportunity for either the CB-EGRA topics to be expanded and better aligned to the IC, or for teachers to supplement the information provided by CB-EGRA with other forms of assessment, such as continuous assessment and terminal exams.

Student performance, as measured by the CB-EGRA, is low across most topics and levels of cognitive demand assessed. Therefore, even the relatively higher performance areas still require the attention of teachers in the classroom. Topics on which students performed particularly poorly, such as phonics and comprehension in Grade 2, and vocabulary in Grade 3, may require additional attention in the IC.

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[1] For more on the history of the methodology, see: https://curriculumanalysis.org/

The Nepalese Context: Basic Education, the Integrated Curriculum Reform, and the SEC Study

Nepal's 2015 Federal constitution established three tiers of government, at federal, province, and local levels (GoN, 2015). The federal line ministries focus on setting national policy and standards while local governments are responsible for delivering basic and secondary education (MoEST, 2021). This study was conducted amidst ongoing rapid change under what has been described as Nepal's 'big bang' approach to decentralisation (Sabarwal, et al. 2021) and schooling disruptions resulting from Covid-19 school closures.

Basic education and the key actors in Nepal

The schooling structure in Nepal includes one year at pre-primary, five years of lower basic, three years of upper basic, and two years each at lower and higher secondary levels (Lohani, et al., 2010; MoEST, 2021). The 2015 constitution guarantees the right to free and compulsory basic education to all Nepali citizens with the relevant law enacted in 2018 (NLC, 2018; Jha 2019; MoEST 2021). At the local government level, 753 local governments are responsible for overseeing the delivery of basic and secondary level education services. The role of the seven provincial governments in education is described as "connected to concurrent powers and shared responsibilities" (MoEST, 2021) and in practice the relationship to other levels of government is often unclear. A highly anticipated federal education act is expected to establish a legal framework that ensures institutional alignment and facilitates smooth coordination across all three levels of government (Samiti, 2022; Ghimire, 2022).

Setting national education laws, standards, and policies is the mandate of the federal government and the MoEST. Key federal-level institutions directly supervised by the MoEST include the National Examination Board (NEB), Education Review Office (ERO), Curriculum Development Centre (CDC), and Center for Education and Human Resource Development (CEHRD). The NEB conducts the Grade 12 higher secondary school leaving examination (GoN, n.d.). The ERO executes an independent mandate of holding the education system accountable (MoEST, n.d.). Established in 2010, ERO regularly conducts large scale national assessments of children's learning achievements across all education levels. CB-EGRA also falls under the mandate of the ERO. The roles of the CDC include developing and reviewing education curricula, student textbooks and other instructional support materials (MoECDC, n.d.). The CEHRD is responsible for supporting teacher professional development and capacity building for education management at subnational levels of the system.

The Integrated Curriculum reform

The Government of Nepal adopted the National Curriculum Framework 2075[2] which sought to balance local needs and a fast-advancing global context by emphasising the need for an education that focuses on children's holistic development, promotion of social justice, and developing capable and competitive citizens (GoN, 2019). In line with these strategic goals, the government introduced an Integrated Curriculum (IC) under which four thematic learning areas would be covered during the first three years of primary school—our surroundings , English, Nepali, and Mathematics. The reform adopted an interdisciplinary approach in linking different subjects to make them more relevant to children's life experiences, such as connecting social studies, science and environment, health and physical education, and creative arts in one thematic area, "our surroundings". Similarly, the reform included integrating life and soft skills into all four thematic learning areas in the lower primary Grades 1-3.

While the IC reform recognises use of student learning evaluation processes for grade promotion, emphasis in the lower primary Grades 1-3 is on continuous assessments for formative purposes. They are to be conducted during the normal process of teaching, assessing all learning aspects (knowledge, skills, attitudes, behaviours, creativity, participation, etc.), providing continuous feedback and remedial support, and maintaining updated child-level learning profiles.

This study focuses on one learning area—Nepali Language Arts and Reading (NLAR) in lower primary Grades 1-3.

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[2] Gregorian year 2018-2019.

With well over 100 recognised living languages, Nepal is a highly multilingual society (Turin and Yadava, 2007; Giri, 2010). 'Nepali' is the national and official language, and in school, Nepali is taught as a subject and used as medium of instruction (GoN, 2019). A key goal of the IC reform was to improve children's Nepali language skills and competences starting in the early primary Grades 1-3. Language comprehension and fluent expression would be achieved by focusing on children's development of early reading, composition, vocabulary, and grammar skills. By the time they completed the Grades 1-3 curriculum, children would be expected to develop phonological awareness, reading fluency, oral and written expression and presentation, content comprehension, and proper response and use of Nepali language in conversation with self-confidence (GoN, 2019).

Between 2015 and 2020, the Government of Nepal, USAID and RTI international partnered to implement the Early Grade Reading Program (EGRP) in Nepal with one of its two main goals being to improve reading performance for children in Grades 1, 2, and 3 (RTI, 2020). The programme had positive impacts on children's reading outcomes regardless of grade or mother tongue status (NORC, 2020). As a follow-on to EGRP, a second Early Grade Reading Program (EGRPII) was implemented between 2020 and 2022, also through a partnership between the GoN, USAID and RTI International. EGRP II supported rollout of the IC by providing technical assistance for ongoing teacher training and teacher professional support at provincial, district, and local levels. IC roll out was disrupted by the Covid-19 pandemic and related school closures (Neupane, et al. 2021), such that only the Grade 1 portion of the new curriculum had been implemented by 2021.

Early Grade Reading Assessment

The Early Grade Reading Assessment (EGRA) is an individually administered oral evaluation of a child's foundational reading skills using a collection of carefully selected subtasks that diagnose skills for literacy acquisition (Dubeck and Gove, 2015). Since 2006 the EGRA tools have been extensively used in many developing countries to measure students' progress toward learning to read in lower primary grades (Gove and Wetterberg, 2011).

In 2017, the GoN developed a framework for conducting group-administered Classroom Based Early Grade Reading Assessments (CB-EGRA) in Grades 1-3 as an alternative to the sample-based EGRA and as a means of conducting continuous assessment for formative purposes (GoN, 2017; RTI, 2020). The CB-EGRA provides school-level learning achievement data that can be used by head teachers, teachers, SMCs, and parents to better support children's reading performances.

EGRP assisted ERO to provide capacity development for implementation of CB-EGRA within the target districts of the National Early Grade Reading Programme, an effort that was continued under EGRP II. In addition, a baseline CB-EGRA was conducted in February 2021 as part of the EGRP II programme, and an endline was conducted in February 2022, focusing only on Grades 2 and 3.

SEC studies and potential sources of misalignment

Between June 2021 and May 2022, RISE Programme, USAID and RTI International partnered with the Government of Nepal to implement this study using the Surveys of Enacted Curriculum (SEC) tools. This partnership aimed to assess the early rollout of Nepal's IC reform for literacy in lower primary grades and identify areas of alignment and misalignment that might impact children's learning.

The design of the IC aimed to achieve a child-centred pedagogy that would effectively respond to the child's learning needs in a local and yet globalised context. Such a curriculum would make the learning experience more relevant and interesting and ensure achievement of the targeted learning goals. To achieve these goals demands a curriculum that is pitched at the right level for instruction to meet the children's learning needs.

The rollout of a new curriculum can encounter implementation obstacles if teachers are unable to effectively translate the prescribed changes into classroom practice, resulting in instructional misalignment between the intended and taught curriculum. Sufficient support materials and effective teacher orientation and training before rollout of a new curriculum are necessary to ensure effective implementation.

As part of the main analyses, this study interprets children's performances on the baseline CB-EGRA as an indicator of where they are prior to the roll out of the IC. Accordingly, the study will address three main alignment questions. First, to what extent does the language arts and reading content prescribed on the IC align with students' learning needs as depicted by their performances on the baseline CB-EGRA? Second, to what extent does Grade 1 teachers' instructional content overlap with the prescribed content on the IC? Third, to what extent does Grade 1 teachers' instructional content align with students' learning needs as identifies by the CB-EGRA baseline assessments?

Methods

The Surveys of Enacted Curriculum methodology provides a structured, systematic approach to analysing the content of instructional materials, such as curriculum standards and assessments, teachers' classroom instructional content, and alignment across components (Blank, Porter and Smithson, 2001; Porter, 2002; Smithson 2013). The methodology involves a combination of document review, in the case of document-based instructional components (e.g., curriculum standards, assessments, textbooks) and quantitative surveys, in the case of teacher instructional content (Atuhurra and Kaffenberger, 2022). SEC captures three descriptive content dimensions: the topics or subtopics being covered, the levels of cognitive demand expected of learners, and the relative emphasis given to each topic/cognitive demand combination.

For the document review, a panel of experts first creates or adapts a taxonomy of all the topics and subtopics that may be covered by the instructional components. The panel also adapts the levels of cognitive demand. These levels are on a five-point scale stretching from least demanding, as in memorise, to most demanding, as in apply to non-routine problems (Porter, 2002). Concrete illustrative examples of the five levels are given in Table 1. With these in place, the panel of experts reviews and codes each segment of content for each document-based instructional component. For curriculum standards, this may involve coding at the level of "learning objectives", and for assessments it involves coding each assessment item.

Table 1. Levels of cognitive demand and illustrative definitions of each

Level of cognitive demand	Illustrative definition
Memorise/Recall	Recognise, identify, or recall facts, definitions, or formulas
Perform Procedures/Explain	Perform procedures, solve routine problems, make observations
Generate/Demonstrate understanding	Communicate ideas, explain findings from analysis, explain reasoning
Analyse/Conjecture	Make and investigate conjectures, infer and predict
Apply to non-routine problems/Evaluate	Apply and adapt strategies, solve novel problems, make connections

Each expert on the panel conducts the coding exercise individually. Then, the panel meets and discusses their codings, and panellists have the opportunity to change their codes. There is no requirement that the panellists reach agreement, however. Once the codes are finalised, the panellists' codings are averaged together. The final output of the coding process is a dataset of topic/subtopic codes and rates of cognitive demand levels that enables the quantitative analysis of the content and alignment across instructional components.

In Nepal, four Nepali literacy experts were recruited onto the expert panel, one each from the CDC, the national university curriculum department, a primary school, and a civil society organisation. They analysed the NLAR IC for and the CB-EGRA for Grades 1, 2, and 3.

For the SEC teacher surveys, survey instruments are developed that list all topics and subtopics from the taxonomy. Teachers are asked to indicate topic/subtopic areas they covered in the classroom and the level(s) of cognitive demand at which they covered them. They are then asked for each topic/subtopic area covered, to give an approximate estimate in terms of the amount of time spent in that content area giving the relative level of emphasis.[3] This process produces a similar dataset as the expert panel dataset, including the topics and subtopics covered, the level of cognitive demand expected for each, and the level of emphasis given to each topic/cognitive demand combination.

In Nepal,149 lower primary NLAR teachers were surveyed as part of the study, drawing from seven districts covering both rural and urban locations.[4] The participating teachers travelled to a central location in each district and participated in one full day of training, followed by half a day to complete the surveys.

The COVID-19 pandemic affected the implementation of the IC, and as such, at the time of the study, the curriculum had only been partially rolled out to Grade 1 teachers. The initial plans for a national roll out for Grades 2 and 3 during the 2021-2022 school year had not occurred prior to this study. Therefore, the teacher survey component of the study only covers Grade 1—for which piloting the IC was done during the 2019-2020 school year. Due to the disruptions affecting the completion of the 2020-2021 school year, the 2021-2022 school year suffered a delayed start to July 2021.[5] This meant that at the time we surveyed Grade 1 teachers in December 2021, five months of the 2021-2022 school year had been completed.

The first set of outputs of the SEC analysis are three-dimensional content maps with topics or subtopics on the Y-axis,[6] levels of cognitive demand on the X-axis, and percent of total coverage (relative emphasis) on the Z-axis (Smithson, 2015). The second set of outputs are alignment indices that result from quantitatively comparing the two content maps. The alignment index is on a zero to one scale, with zero representing no overlap in content (perfect misalignment) and one representing complete overlap in content (perfect alignment) (Porter, 2002). On this scale, a topic-level (coarse grain) alignment measure of 0.5 is considered reasonably well aligned (Smithson, 2015). This is not, however, a hard threshold. While the alignment index is a quantitative measure, interpretation is a qualitative exercise. For example, if teachers have been provided highly structured curriculum and instruction materials, a higher level of alignment between teacher instruction and curriculum may be expected. In general terms, interpretation of the SEC alignment index depends on context and expectations for alignment.

SEC is a descriptive tool, describing the content of instructional components and their level of alignment. It does not provide a normative conclusion on the 'best' or 'right' form that content or alignment should take (Atuhurra and Kaffenberger, 2022). Interpretation is a qualitative exercise through which experts in a study's context can use results to determine whether or how instructional components should be reformed or alignment improved to meet education objectives.

Results

The content and progression of the lower primary Integrated Curriculum in Nepal

In 2018 the Government of Nepal undertook major revisions to its lower primary (basic level, Grades 1-3) curriculum with an overarching goal of achieving children's holistic development during their early years in school. By interlinking

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[3] In this study, teachers were asked to select 'not covered' in the case of a subtopic they did not cover in the classroom, 'slight coverage' for one class/lesson, 'moderate coverage' for 1-5 classes/lessons, and 'sustained coverage' for more than five classes/lessons.

[4] 67 teachers were from the two more-urban districts of Parsa and Rupandehi and the remainder from five more-rural districts—Achham, Baglung, Rasuwa, Salyan, and Taplejung.

[5] Under normal circumstances, Nepal's school year runs from April to March of the following year.

[6] In this Note we report results at the Topic level.

different subject areas, the IC aimed to make the learning process more relevant to the child's lived experiences (GoN, 2019).

Figure 1 shows the content maps for the Grades 1, 2, and 3 IC. The content maps are read like three-dimensional topographical maps, as follows:

- topics are on the Y axis,
- levels of cognitive demand are on the X axis, ordered from least demanding on the left to most demanding on the right, and
- level of emphasis, as a percent of total coverage, is on the Z axis. The level of emphasis is given for each topic/ cognitive demand intersection point.

Figure 1: Topic-level content coverage of the Integrated Curriculum—Grades 1-3
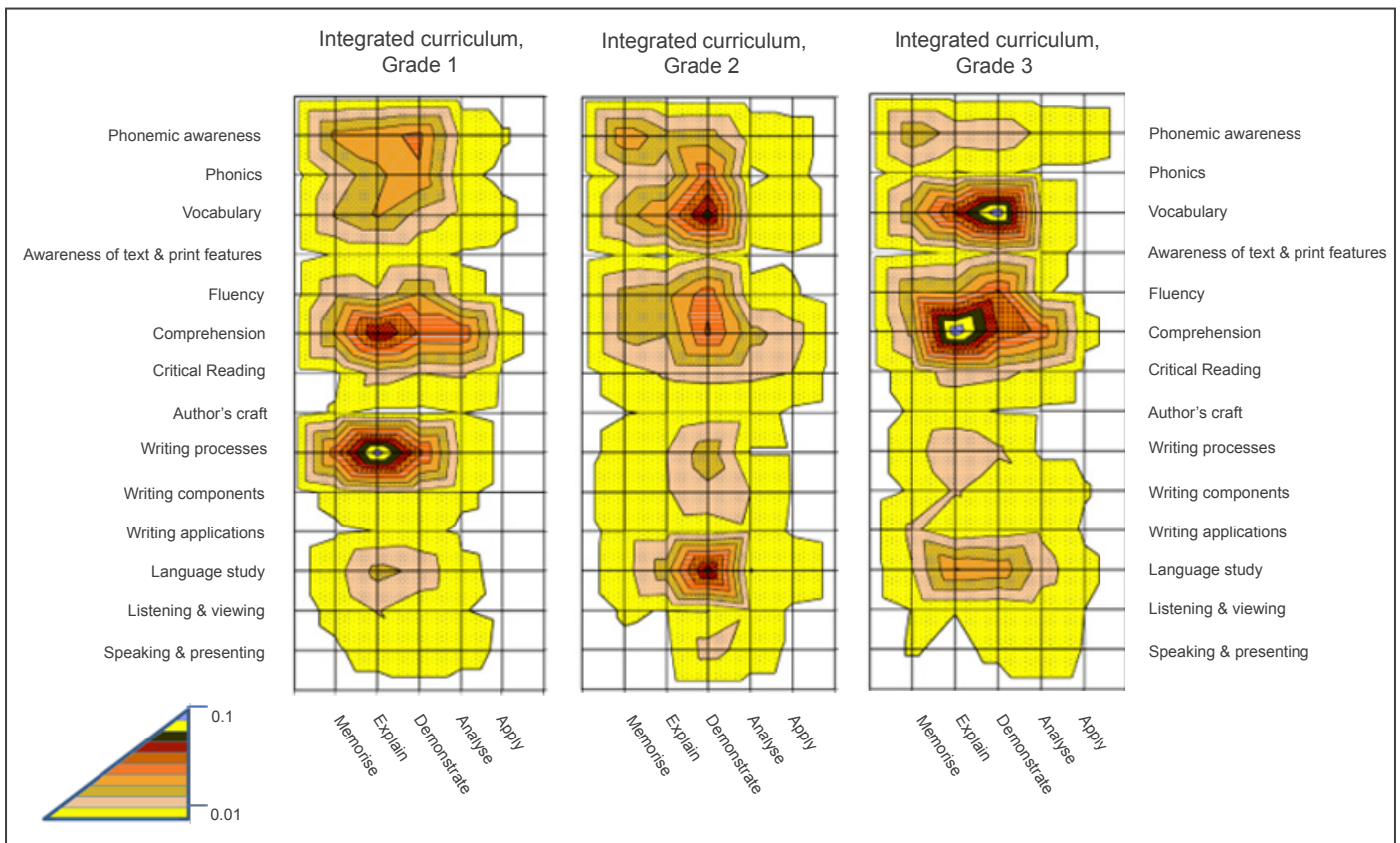
Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100 percent of emphasis).

Grade 1 topic coverage. The topical content coverage in the new Grade 1 NLAR IC depicts a broad spread (Figure 1), touching on almost all topics. Three topics receive more emphasis than others, however, including phonemic awareness, comprehension and writing processes. Accounting for 22 percent of overall coverage, comprehension, a higher-order foundational reading topic, is the most emphasised single topic area in the syllabus. At 21 percent of overall emphasis, 'writing processes' comes second, highlighting the importance the IC attaches to early development of foundational writing skills. With about 31 percent of total coverage, lower-order foundational reading topics also attract significant emphasis, including phonemic awareness, phonics, and vocabulary.

Grade 1 cognitive demand. Over two-thirds of cognitive demand emphasis in the Grade 1 IC targets two mid-level performance expectations—'explain' at 36 percent and 'demonstrate' at 31 percent, a clear portrayal of intended early focus on getting children to follow instructions and develop critical connections for proficient reading and writing. Accounting for 20 percent of total emphasis, 'memorise' takes a sisable share of the intended Grade 1 cognitive demand—suggesting that rote methods are assigned a significant role in developing children's early reading and writing skills.

Grade 2 topic coverage. In Grade 2, there is a shift in the prescribed topic-level emphasis with vocabulary, comprehension, and language study jointly accounting for a large share of the prescribed content—totalling to 42 percent of total coverage. Overall, the distribution of emphasis in Grade 2 is more balanced across topics and all high emphasis topic areas covered in Grade 1 feature prominently in Grade 2—albeit with a major decline in emphasis for 'writing processes'. The middle panel in Figure 1 shows six different topics depicting peaks of emphasis compared to four in the first panel.

Grade 2 cognitive demand. The cognitive demand in Grade 2 progresses learning expectations to the higher-order skill level 'demonstrate', which accounts for 43 percent of overall coverage. While emphases on 'explain' and 'memorise' remain large at 21 percent and 18 percent respectively, 'demonstrate' is by far the dominant skill level prescribed for this grade—signifying the syllabus standards' intention to move the teaching and learning experience away from teacher-heavy 'blindly do as instructed' pedagogies to developing deeper learner abilities to make connections and recognise relationships. For example, to depict understanding of 'vocabulary', learners are expected to recognise relationships among 'prefixes, suffixes and root words'.

Alignment between Grades 1 and 2. The between-grade topic-level content alignment measure is 0.67 on a 0-1 scale (Table 1), representing a high level of alignment and therefore a somewhat low level of stretch between the prescribed content for the two successive grades. This measure suggests that on all three dimensions (topics, cognitive demand and emphasis), the prescribed content for Grade 2 differs from that for Grade 1 about one third of the time. In addition to the overall upward shift in cognitive demand for Grade 2 (as noted above), a topic-by-topic analysis shows the main coverage differences including a large reduction in emphasis on 'writing processes' and doubling of emphasis on 'language study' in Grade 2.

Grade 3 topic and cognitive demand coverage. The same three high-emphasis topics at Grade 2 account for most of the prescribed content for Grade 3, only in Grade 3 'comprehension' and 'vocabulary' have larger shares, at 24 percent and 21 percent respectively. 'Language study' accounts for 11 percent of coverage.

The prescribed cognitive demand for Grade 3 is focused on 'explain' and 'demonstrate'—with these two accounting for two-thirds of overall emphasis, i.e., 32 percent and 34 percent respectively (similar to Grade 1). For both 'comprehension' and 'language study' the IC covers the higher-order cognitive demand level of 'analyse', totalling 14 percent—representing a notable level of stretch in performance expectations.

Alignment between Grades 2 and 3. The topic-level progression alignment measure between the prescribed content for grades 2 and 3 is 0.73—suggesting even more overlap in content from Grade 2 to 3 than the case between Grades 1 and 2 (discussed above). Two differences between Grade 2 and 3 stand out, however. First, 'phonics' is almost entirely dropped in Grade 3. Second, there are significant increases in emphasis for 'vocabulary' and 'comprehension', with 'explain' becoming an even more dominant cognitive demand level for the latter in Grade 3.

Alignment between Grades 1 + 2 vs. 3. Aggregating the IC content for Grades 1 and 2 enables us to examine alignment with Grade 3 content. For a child progressing to Grade 3, this measure tells us the extent of stretch they will likely experience while engaging with the IC content for Grade 3. Similar to the previous analyses, the alignment measure is 0.71. Children progressing to Grade 3 can expect a smooth progression and high level of content overlap as they engage with the prescribed content for this grade.

In sum, across all the three grades, the IC prescribes relatively high coverage of the higher-order reading topic 'comprehension', closely followed by 'vocabulary' in Grades 2 and 3. Sequential progression on content between grades suggests a fairly minimal stretch. The lower three cognitive demand levels (memorise, explain, and demonstrate) attract

the most emphasis in all three grades with some consideration also given to 'analyse'. On the contrary, 'apply to non-routine problems' is almost entirely omitted in all grades.

The instructional content of Grade 1 teachers of Nepali language arts and reading

The teacher instructional survey included 149 Grade 1 teachers from 7 districts who received EGRP II implementation support during the rollout of the IC. Quite similar to findings from other developing country contexts (Uganda and Tanzania), we find that these teachers spread their coverage relatively evenly across all topic areas and the first three levels of cognitive demand. This broad spread in emphasis results in limited time allocation for each content area and a narrow range in emphasis across topics—stretching from 5 percent on 'writing applications' to 12 percent on 'phonics'.

Figure 2 shows three content maps depicting Grade 1 teachers' self-reports of instructional content covered during the first half of the school year 2021-2022. From the panel on the left (all teachers), two topics 'phonics' and 'comprehension' attract slightly more emphasis than all others and 92 percent of cognitive emphasis is evenly spread across the first three levels of 'memorise' (32 percent), 'explain' (31 percent) and 'demonstrate' (29 percent). Analysing teachers' instructional content by rural-urban locations reveals no systematic differences on all three dimensions; the two content maps on the right are similar in nearly all respects.[7]

Figure 2: Grade 1 teachers' classroom content: All teachers and by rural/urban
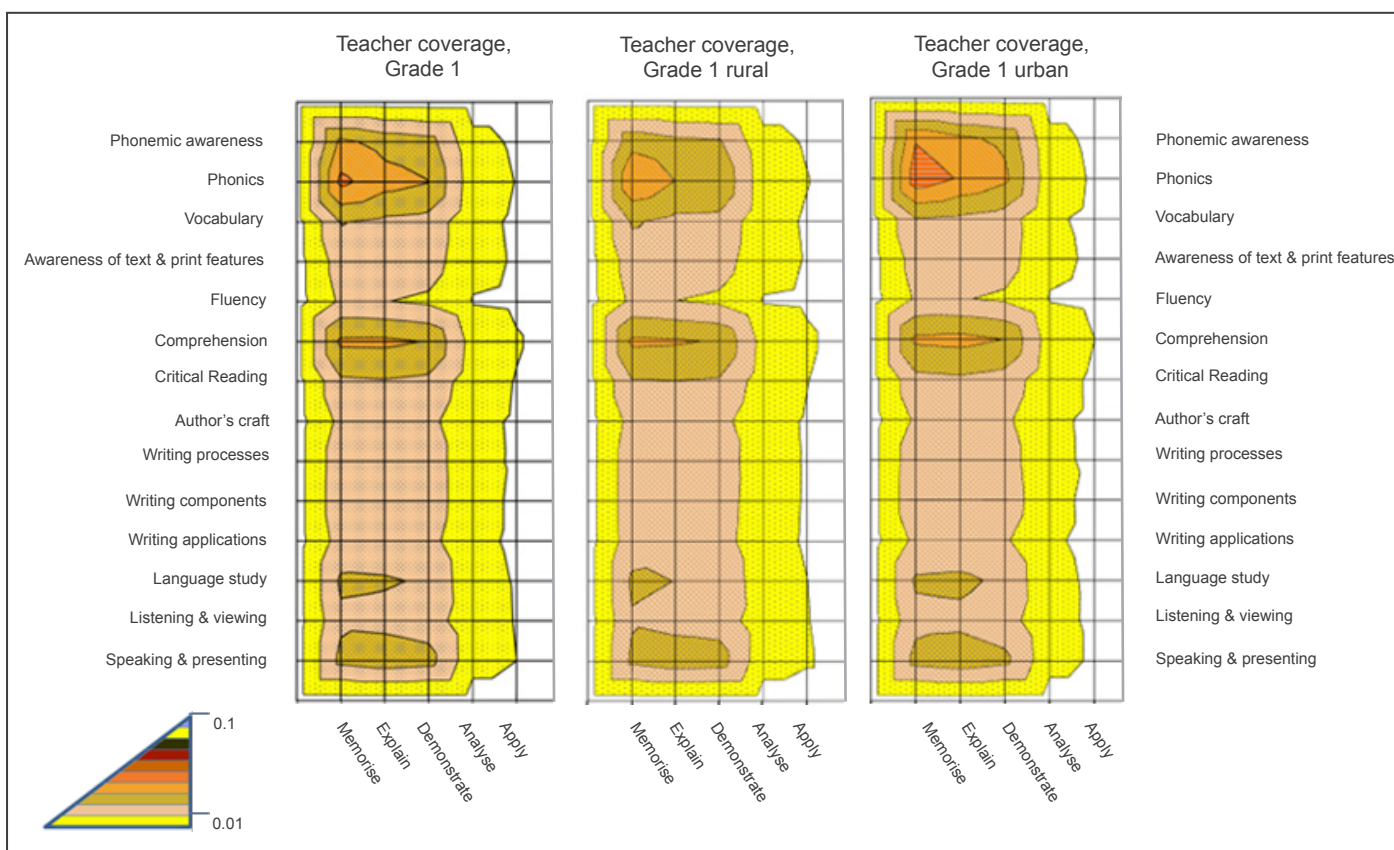
Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100 percent of emphasis).

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[7] The only distinction is that Grade 1 teachers from urban districts spend slightly more time on 'phonics' and 'phonemic awareness'.

The content of the CB-EGRA assessments

The CB-EGRAs depict high levels of content selectivity. This is by design, as the CB-EGRAs are primarily intended to focus on the early development of children's foundational reading competences that become critical for developing abilities to read for meaning and subsequent abilities for reading to learn broadly.

In all three grades, 'comprehension', a higher-order reading skill, receives the most topic emphasis (Figure 3). On the Grade 1 CB-EGRA 'phonics' receives the second-most topic emphasis, at 25 percent of total coverage. In all three grades 'vocabulary' is also in the top three topics covered. Five additional topics are covered on the CB-EGRAs, including 'phonemic awareness', 'listening and viewing', 'fluency', 'writing components', and 'writing applications'. 'Phonemic awareness' and 'listening and viewing' receive about the same levels of emphasis across grades while the coverage structure for the latter three is highly dynamic from grade to grade.

In terms of cognitive demand expectations on the CB-EGRAs, broad coverage is depicted stretching from 'memorise' to 'analyse'. While 'memorise' and 'demonstrate' account for the majority of emphasis on the Grade 1 assessment, 'demonstrate' and 'analyse' are the most emphasised for Grades 2 and 3. No emphasis is given to the higher-order performance expectation 'apply or adapt to non-routine problems".

Figure 3: Topic-level content coverage of the CB-EGRAs—Grades 1-3
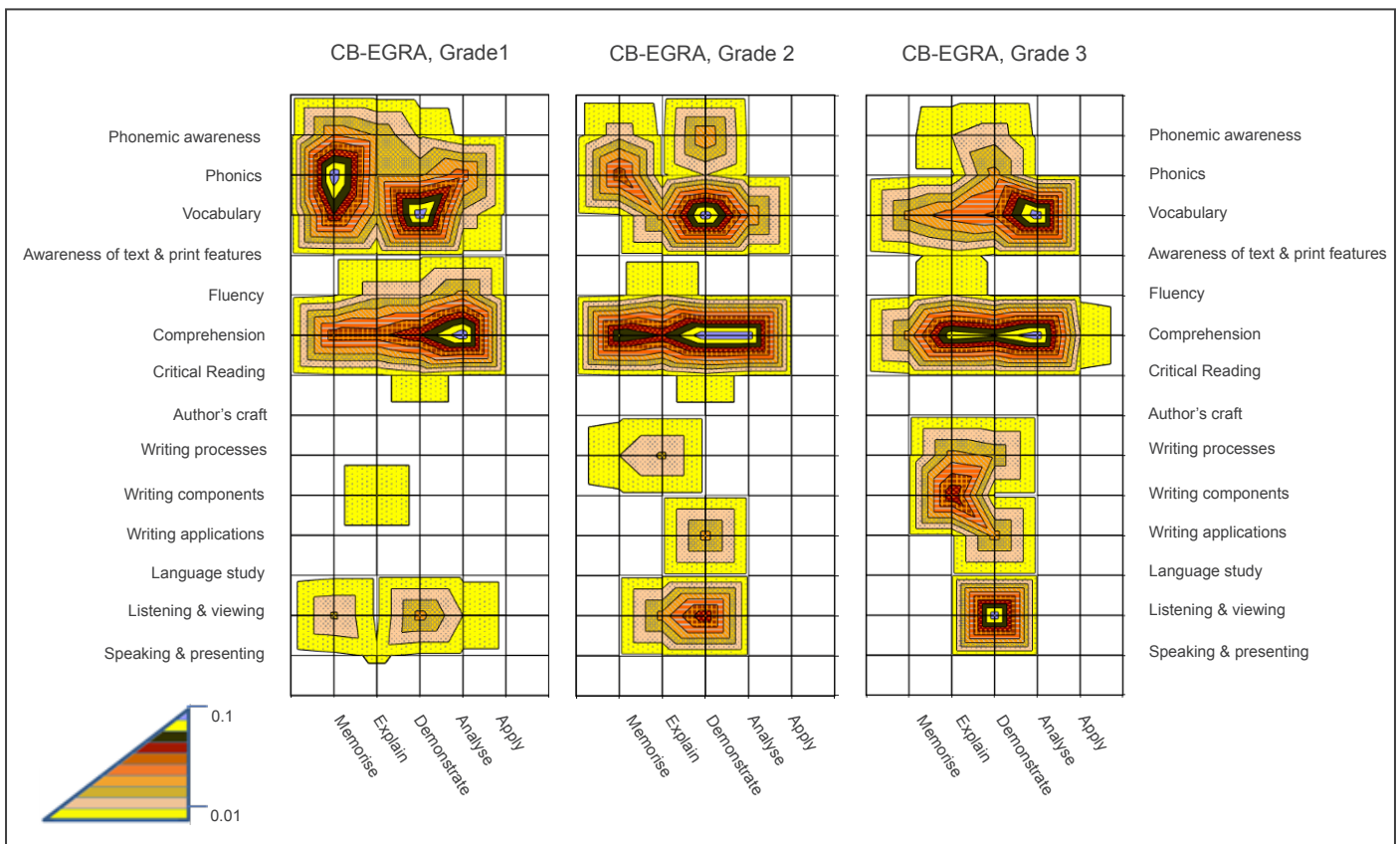
Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100 percent of emphasis).

The progression alignment measure on the CB-EGRAs between Grades 1 and 2 is 0.56 (Table 2), suggesting differences in content focus for about half the emphasis across the assessments for the two grades. This measure is tending towards a moderate level of stretch that might be what is expected to ensure children are neither over- nor under-stretched by the covered content on the CB-EGRAs when they progress from first to second grade. This moderate progression on content is explained at two levels. First, the significant increase in coverage for comprehension and decrease in coverage for 'phonics'. Second, an equally significant shift in cognitive demand emphasis from 'memorise' in Grade 1 to 'demonstrate' in Grade 2, especially within two topic areas: 'phonemic

awareness' and 'vocabulary'.

Progression alignment between Grades 2 and 3 is 0.67, indicating a higher level of alignment and a lower level of stretch between the assessments for the two grades relative to that seen earlier between Grades 1 and 2. This stretch is explained by both subtopic-level changes for 'phonemic awareness' and 'phonics' and significant increase in cognitive demand emphasis for 'vocabulary' from 'demonstrate' to 'analyse'.

Grade 2 and 3 children's baseline achievements on the CB-EGRAs

Student performance on the CB-EGRA assessments was measured by EGRP II to form a baseline of student learning and performance. This student performance data was collected for 752 students in Grade 2 and 826 students in Grade 3 from a sample of 45 schools in 7 districts; unfortunately, student performance data was not available for Grade 1 students (RTI International, 2021).

One critical aspect when analysing student performance data is that performance results are limited by the scope and coverage of the CB-EGRA assessment. This means that we cannot observe student performance on content that is not covered on the assessment, even if that content was covered in the curriculum or instruction. Another aspect to remain cognizant of is the structure of the CB-EGRA assessments: these assessments are primarily multiple-choice assessments (with only some writing-based questions), which introduces an element of 'guessing' that in theory can overstate children's learning levels.

Figure 4 shows two sets of content maps depicting the grade-level baseline CB-EGRA and student performances. While the content maps on the left are read in the same way as the others shown in earlier figures (as seen above), the performance maps on the right present a unique feature in the z-axis which warrants explanation. The student performance content maps differ from the standards- and teacher-instruction content maps reported earlier. They intentionally use a different colour-scale and have a different definition of the z-axis. The z-axis of the student performance content maps is split between four categories of increasing height and uses traffic-light style colours to illustrate their different meaning and to make them more intuitive: grade-average scores of less than 40 percent on a particular topic/cognitive demand level combination are displayed as red, greater than or equal to 40 percent but less than 60 percent are yellow, greater than or equal to 60 percent but less than 80 percent are green, and 80 percent and above are blue.
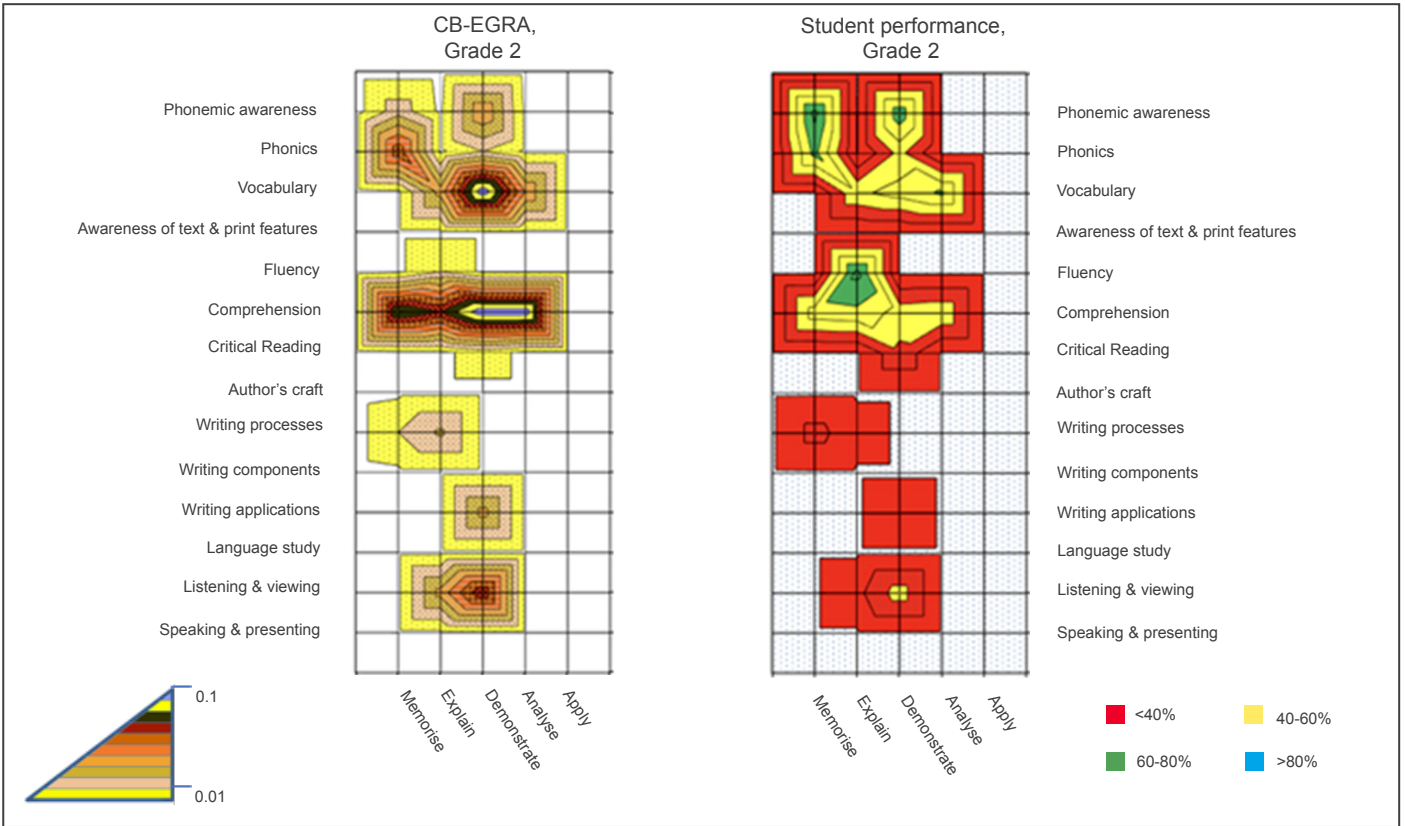
In panel A (Grade 2), we see that students performed relatively well on phonemic awareness questions (average score of 51 percent). Students achieved an average score of 35 percent on vocabulary, followed by phonics (34 percent) and comprehension (33 percent). In no single domain do we see a grade-average higher than 55 percent, meaning that even the questions on which students score the highest were still answered incorrectly by nearly half of students. In terms of cognitive demand, students performed best on memorise (an average score within the grade of 37 percent) and analyse questions (36 percent), with explain and demonstrate trailing behind (at 27 percent and 26 percent respectively); there were no questions on the Grade 2 CB-EGRA at the 'apply' level.

In panel B (Grade 3), we see that students performed best on questions on awareness of text and print features (an average score within the grade of 48 percent), followed by phonemic awareness (42 percent), and comprehension (41 percent) respectively. These were followed by writing components (36 percent), vocabulary (33 percent) and listening and viewing (31 percent). In terms of cognitive demand, students performed best on memorise (an average score within the grade of 49 percent) and apply questions (39 percent); performance across the middle-three cognitive demand levels was relatively similar at around 30 percent.
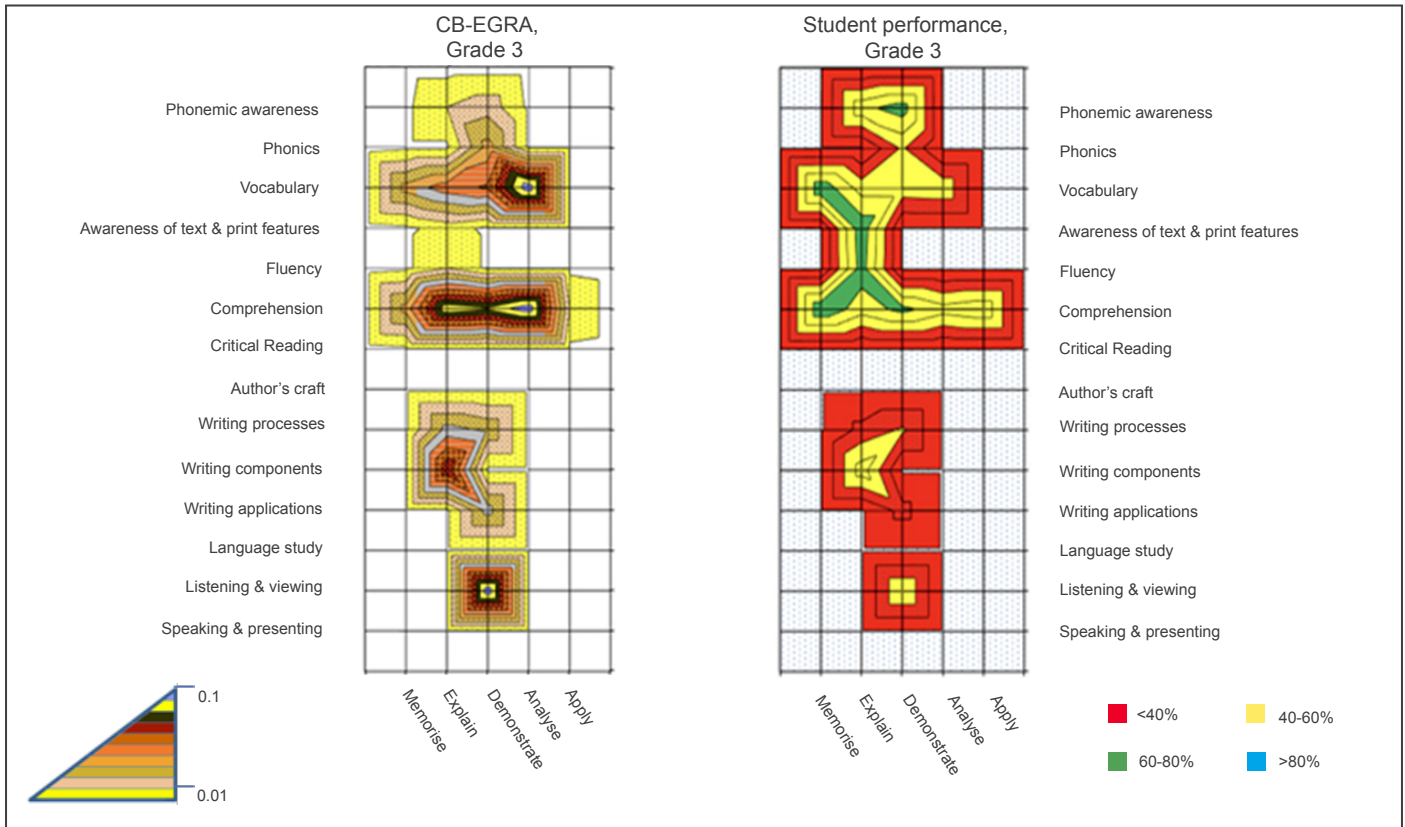
In terms of cognitive demand, we see that students perform better on the three lower-order cognitive demand levels (memorise, explain, demonstrate) in Grade 3 than they do in Grade 2, whereas Grade 2 students performed marginally better on the 'analyse' cognitive demand level than Grade 3 students; 'apply' was not measured in Grade 2.

Figure 4: CB-EGRAs and students' performances for Grades 2 and 3

Panel A

CB-EGRA,
Grade 2

Student performance,
Grade 2

| Phonemic awareness |
| Phonics |
| Vocabulary |
| Awareness of text & print features |
| Fluency |
| Comprehension |
| Critical Reading |
| Author's craft |
| Writing processes |
| Writing components |
| Writing applications |
| Language study |
| Listening & viewing |
| Speaking & presenting |

Memorise   Explain   Demonstrate   Analyse   Apply

0.1
0.01

<40%   40-60%
60-80%   >80%

Panel B

CB-EGRA,
Grade 3

Student performance,
Grade 3

| Phonemic awareness |
| Phonics |
| Vocabulary |
| Awareness of text & print features |
| Fluency |
| Comprehension |
| Critical Reading |
| Author's craft |
| Writing processes |
| Writing components |
| Writing applications |
| Language study |
| Listening & viewing |
| Speaking & presenting |

Memorise   Explain   Demonstrate   Analyse   Apply
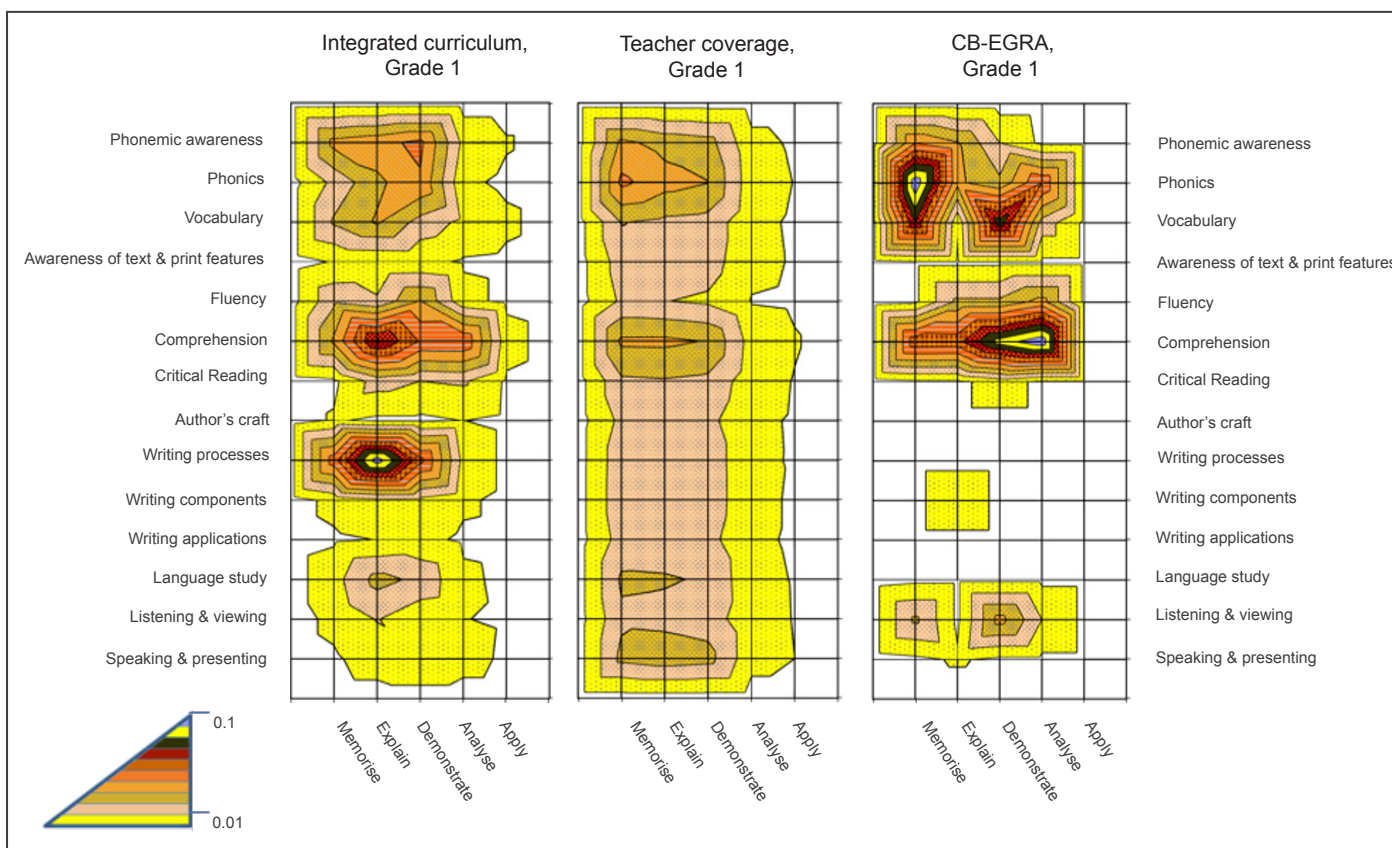
0.1
0.01

<40%   40-60%
60-80%   >80%

Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis (for CB-EGRA) or level of performance (for student performance) on the Z axis.

Alignment of Grade 1 teacher instructional content and the Integrated Curriculum and CB-EGRA

Alignment between teacher instruction and the IC. Grade 1 teachers' instructional content is generally well aligned with the IC (see Figure 5). As described in Sections 4.1 and 4.2, both components depict broad coverage across all topic areas and emphasise mostly the first three levels of cognitive processing—'memorise', 'explain', and 'demonstrate'.[8] At 0.63, the coarse-grain alignment measure exceeds the 0.5 rule of thumb for reasonably acceptable cross-component alignment (Atuhurra and Kaffenberger, 2022). This measure suggests that for more than 60 percent of the time, teachers' instructional coverage matches the IC intentions.

Figure 5: Grade 1 topic-level content coverage across Integrated Curriculum, Instruction, and CB-EGRA

Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100 percent of emphasis).

While the overall picture is of good alignment between the two components, there are notable differences that deserve highlighting. First, the IC places greater emphasis—illustrated through higher 'peaks'—on a few topic/cognitive demand combinations. This is in contrast to teachers who spread their time more evenly and thus have fewer and lower 'peaks'. Consider the topic 'comprehension' at cognitive level 'explain'. This specific content area attracts high relative emphasis across both components, but the difference in the extent of emphasis between the components is quite large—7 percent on the IC as opposed to 3 percent on teachers' instructional coverage. Similarly at the aggregated level, 'comprehension' as a highly emphasised topic across both components accounts for twice as much emphasis on the IC relative to teachers' classroom practice—22 percent versus 11 percent.

Second, the topic 'writing processes' attracts significantly large coverage on the IC but only minimal attention from teachers' classroom content,[9] suggesting that teachers spend relatively little time focusing on developing children's foundational pre-writing, drafting, and penmanship skills.

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[8] The IC also prescribes a significant 14 percent coverage to the two higher-order cognitive processes of 'analyse' and 'apply to non-routine situations' as opposed to the 8 percent emphasis by teachers.

[9] A large 21 percent emphasis is allocated to this topic on the IC as opposed to 6 percent from teachers' coverage.

Alignment between teacher instruction and the CB-EGRA. Turning to alignment between teacher instruction and the CB-EGRA, we find that phonics, vocabulary, and comprehension attract significantly larger relative emphasis on the CB-EGRA. The CB-EGRA has much sharper peaks of emphasis for these topics, while teachers spread their coverage more evenly. On cognitive demand, the CB-EGRA tends to target higher-order skills while the teachers mostly emphasise lower-order skills. For all five foundational reading topics, teachers emphasise 'memorise' and 'explain'. Conversely, with the exception of 'phonemic awareness' for which the CB-EGRAs mostly emphasise 'memorise', the higher-order cognitive processes 'demonstrate' and 'analyse' are the most targeted on the CB-EGRAs.

Alignment of content: Integrated Curriculum and CB-EGRAs

In this section we report on the cross-component alignment of content between the CB-EGRAs and the IC. We focus on five topics that are most critical for development of foundational reading abilities and account for a large proportion of total emphasis on both components—phonemic awareness, phonics, vocabulary, fluency, and comprehension. Accordingly, illustrative references are made to respective content maps (Figures 5, 6 and 7) and no overall alignment measures are reported.

Figure 6: Grade 2 topic-level alignment across Integrated Curriculum and CB-EGRA
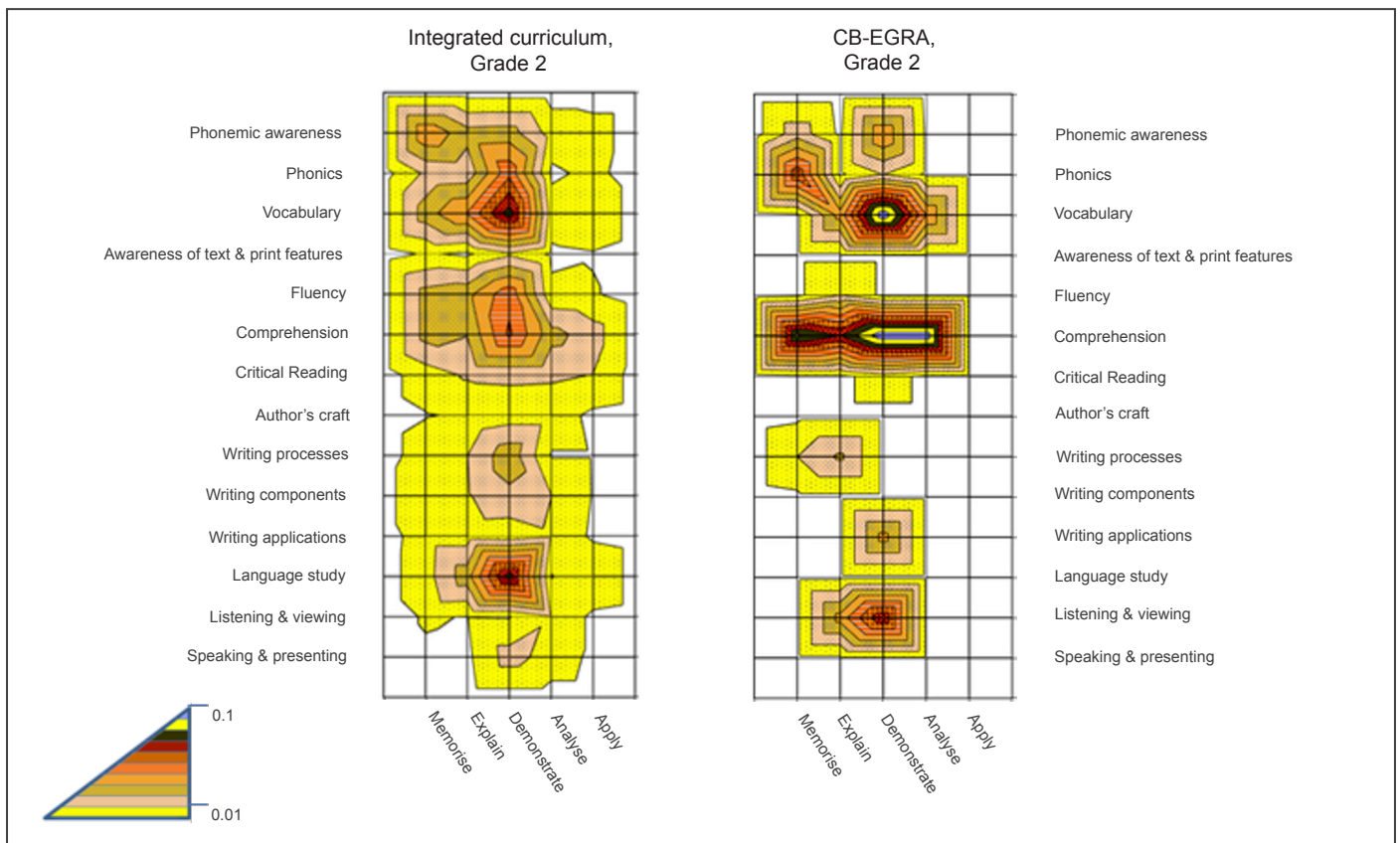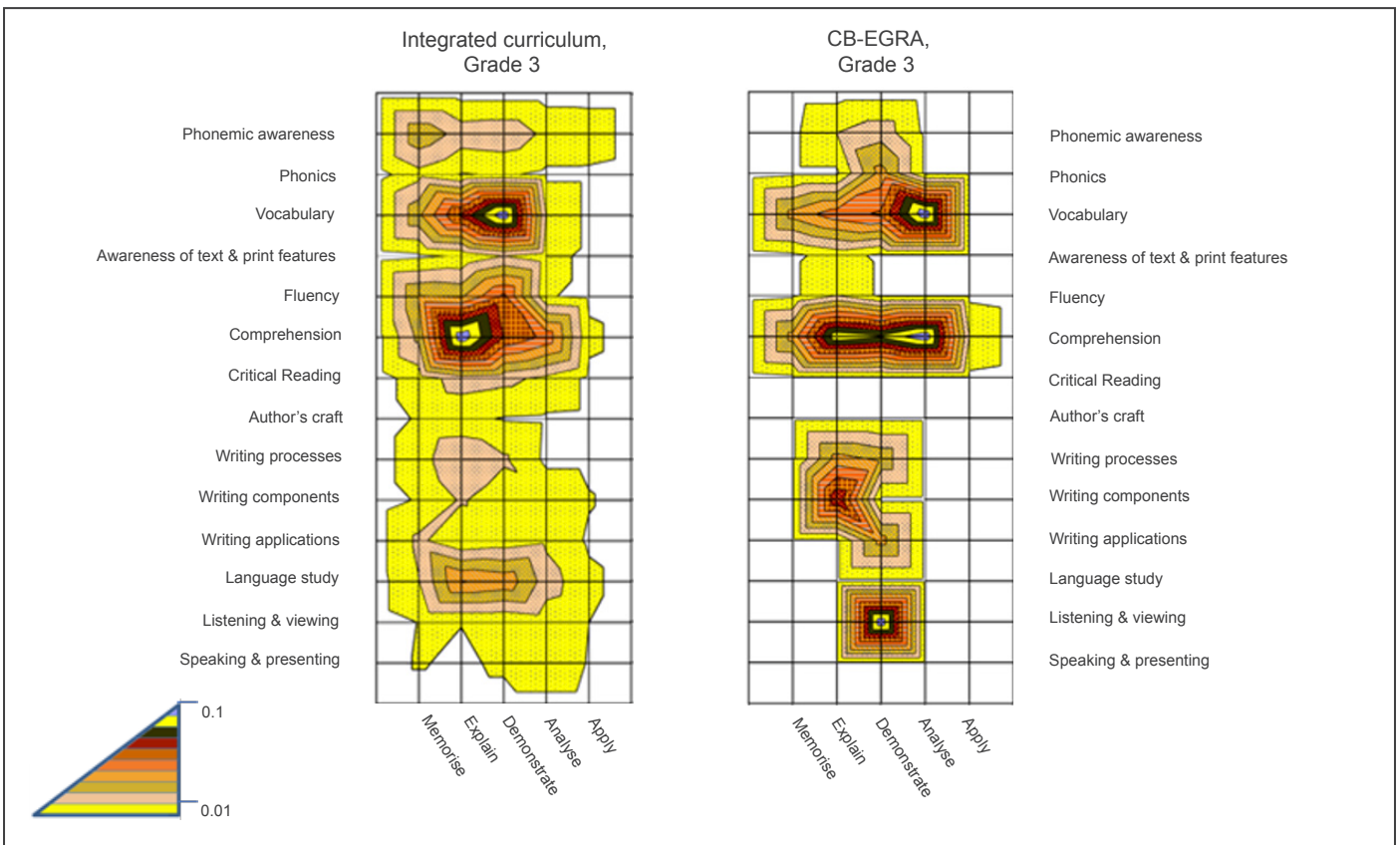

Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100 percent of emphasis).

Our analyses uncover two main alignment findings over the three grades. First, there are clear emphasis differences in the targeted cognitive demand levels, with the CB-EGRAs mostly targeting middle- to higher-order while the IC focuses on lower-order cognitive skills. For instance in Grade 1, emphasis on cognitive demand for the topic 'fluency' is concentrated on 'demonstrate' in the IC and 'analyse' on the CB-EGRA. In both Grades 2 and 3, the IC prescribes 'phonemic awareness' to be covered mainly at 'memorise' while the CB-EGRAs cover the same topic predominantly at 'demonstrate'. A reverse sequence in cognitive demand is observed for the topic 'phonics', with the IC mostly targeting 'demonstrate' in Grade 2 and 'memorise' in Grade 3 while the CB-EGRAs reverse this sequence. In Grade 3, emphasis on cognitive demand for 'vocabulary' is concentrated on 'demonstrate' in the IC and 'analyse' on the CB-EGRAs.

Second are differences in the emphases on different topic areas. In all three grades, 'comprehension' attracts a larger relative emphasis on the CB-EGRAs than the IC. This finding also applies to phonics and vocabulary in Grade 1. To put these emphasis differences into perspective, the CB-EGRAs cover only the 'reading' strand while the IC depicts a broader and more comprehensive coverage structure of Nepali language arts and reading. By design therefore, relatively higher proportions of emphasis are expected for topics appearing on the CB-EGRAs as total emphasis is spread across fewer topics. The CB-EGRAs are designed as group-level tests administered in a classroom setting for primarily diagnostic purposes to inform formative or remedial foundational reading instructional purposes (GoN, 2017). Interpreting these assessments as comprehensive standardised evaluations of children's literacy competence levels is thus not appropriate and not the intended design of the assessments. However, the analysis provided here does identify areas where the CB-EGRA could be better aligned to curricular and instructional content and methods in the Nepal context.

Figure 7: Grade 3 topic-level alignment across Integrated Curriculum and CB-EGRA

Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis on the Z axis. The levels of emphasis at each topic/cognitive demand intersection point sum to 1 (totalling 100% of emphasis).

Alignment of the Integrated Curriculum with children's foundational reading needs

We also analyse student performance on the CB-EGRA to see how well the new IC responds to students' learning levels and needs. Student performance data was collected for Grades 2 and 3 as a baseline before the roll-out of the new IC, and helps answer the question: "To what extent does the IC respond to student needs?"

Figure 8 shows a comparison of the IC with the CB-EGRA and associated student performance for Grade 2 students. While the alignment of the CB-EGRA with the IC was discussed in section 4.6, this section explores the relationship between the new IC and what student learning levels were under the old curriculum.

As discussed in Section 4.4, Grade 2 students performed best on phonemic awareness questions (51 percent grade average), and least well on critical reasoning, listening and viewing, writing processes, and writing application questions (grade averages of lower than 20 percent). The Grade 2 IC focuses on vocabulary and comprehension, on which students perform moderately well, and language study, which is not covered by the CB-EGRA.

The alignment between what students know at the start of Grade 2 and what is prescribed in the IC requires nuanced

interpretation. For example, students performed best on vocabulary questions at the 'analyse' cognitive demand level; however, the IC focuses on vocabulary at the lower cognitive-demand level of 'demonstrate', which may not provide an ideal level of challenge. Likewise, students performed best on phonemic awareness questions at both the 'memorise' and 'demonstrate' cognitive demand levels, however the IC focuses on phonemic awareness primarily at the 'memorise' level.

Even the highest level of student performance was a grade-average of 53 percent, however, indicating that most students need instruction on most topics covered by the CB-EGRA. The IC may need to allow for additional coverage and remediation of topics from earlier grades to allow mastery.

Figure 8: Grade 2 topic-level alignment across Integrated Curriculum, CB-EGRA and student performance
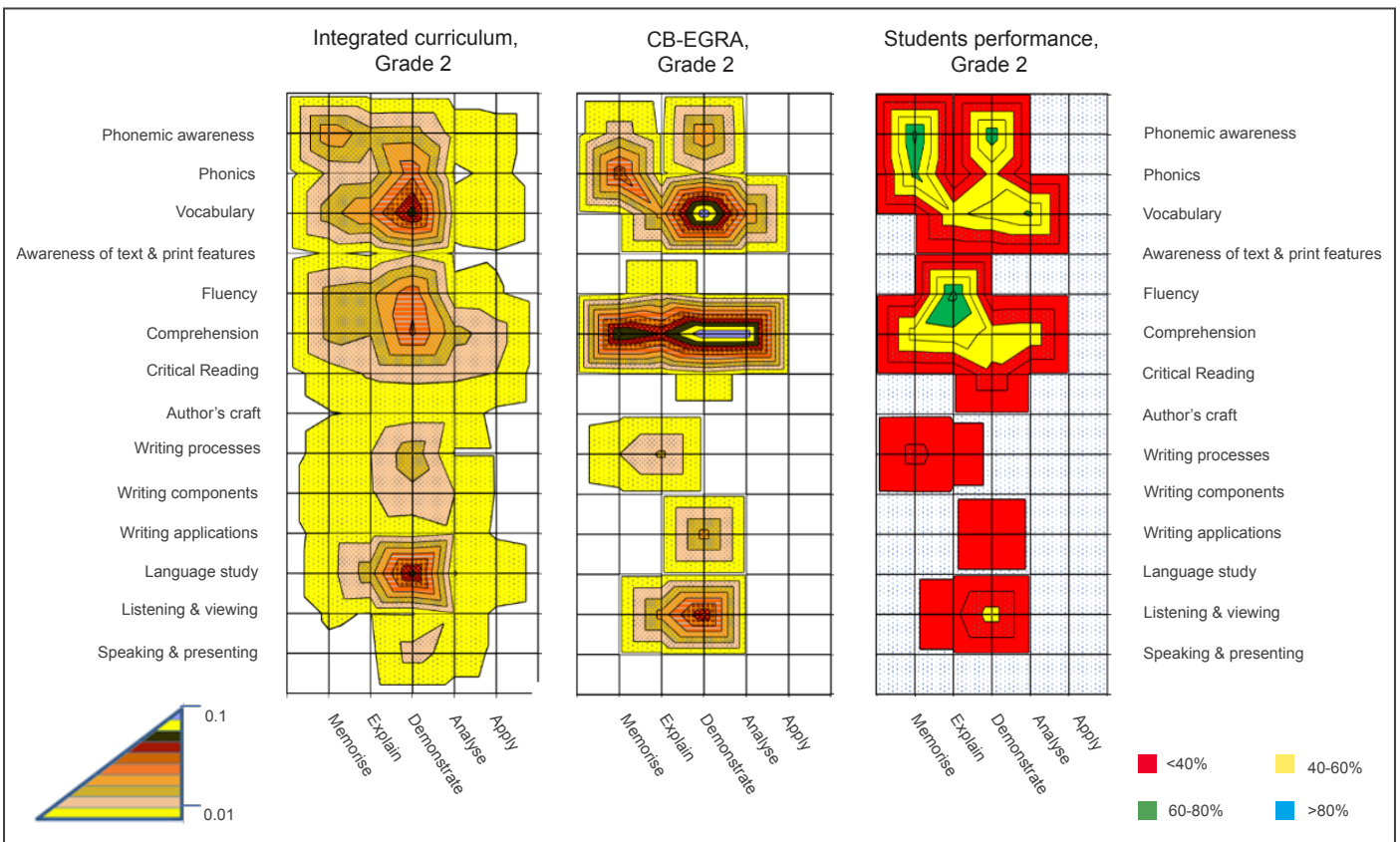
Source: Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis (for CB-EGRA) or level of performance (for student performance) on the Z axis.

Figure 9 shows a comparison of the IC with the CB-EGRA and associated student performance for Grade 3 students. As discussed in Section 4.4, Grade 3 students performed best on awareness of text and print features (highest at the explain cognitive demand level), and phonemic awareness questions (highest at the demonstrate level). The new Grade 3 IC places significant emphasis on vocabulary (at the demonstrate level) and comprehension (at the explain level) on which students perform moderately less well.

The IC - student performance alignment in Grade 3 shows some different patterns to the alignment in Grade 2. Student performance on vocabulary was highest at the memorise level, and the IC emphasis was highest at the demonstrate level, likely indicating an appropriate level of progression (whereas in Grade 2 the IC focused on a lower cognitive demand level than baseline performance peak). Phonemic awareness, however, is emphasised at the lower cognitive demand level of 'memorise' on the Grade 3 IC (as in Grade 2 IC), but student performance in Grade 3 peaked at 'demonstrate', a higher cognitive demand level. Lastly, student performance on comprehension was highest at the 'memorise' and 'demonstrate' levels, while the Grade 3 IC emphasised the level in between these, the 'explain' level.

Figure 9: Grade 3 topic-level alignment across Integrated Curriculum, CB-EGRA, and student performance
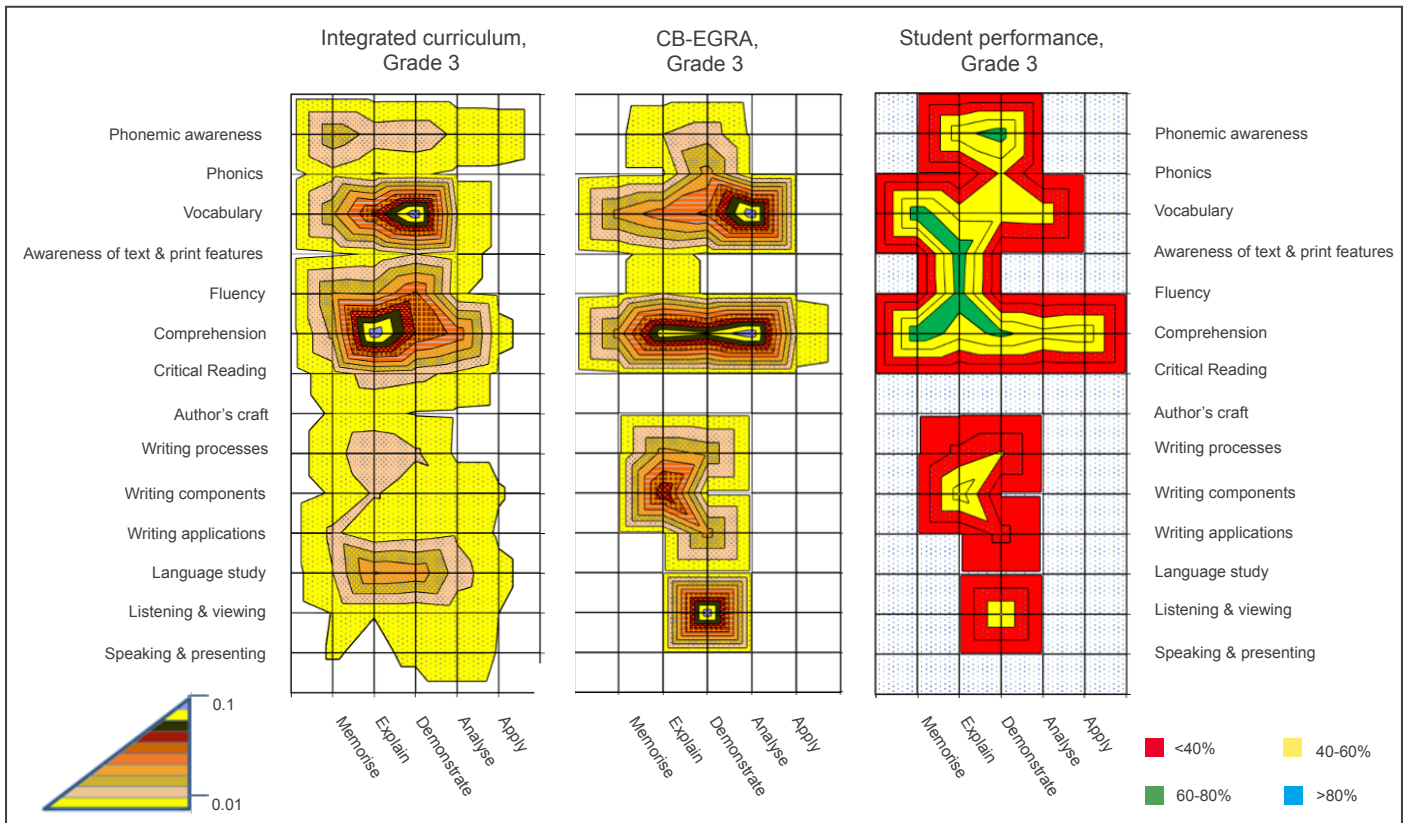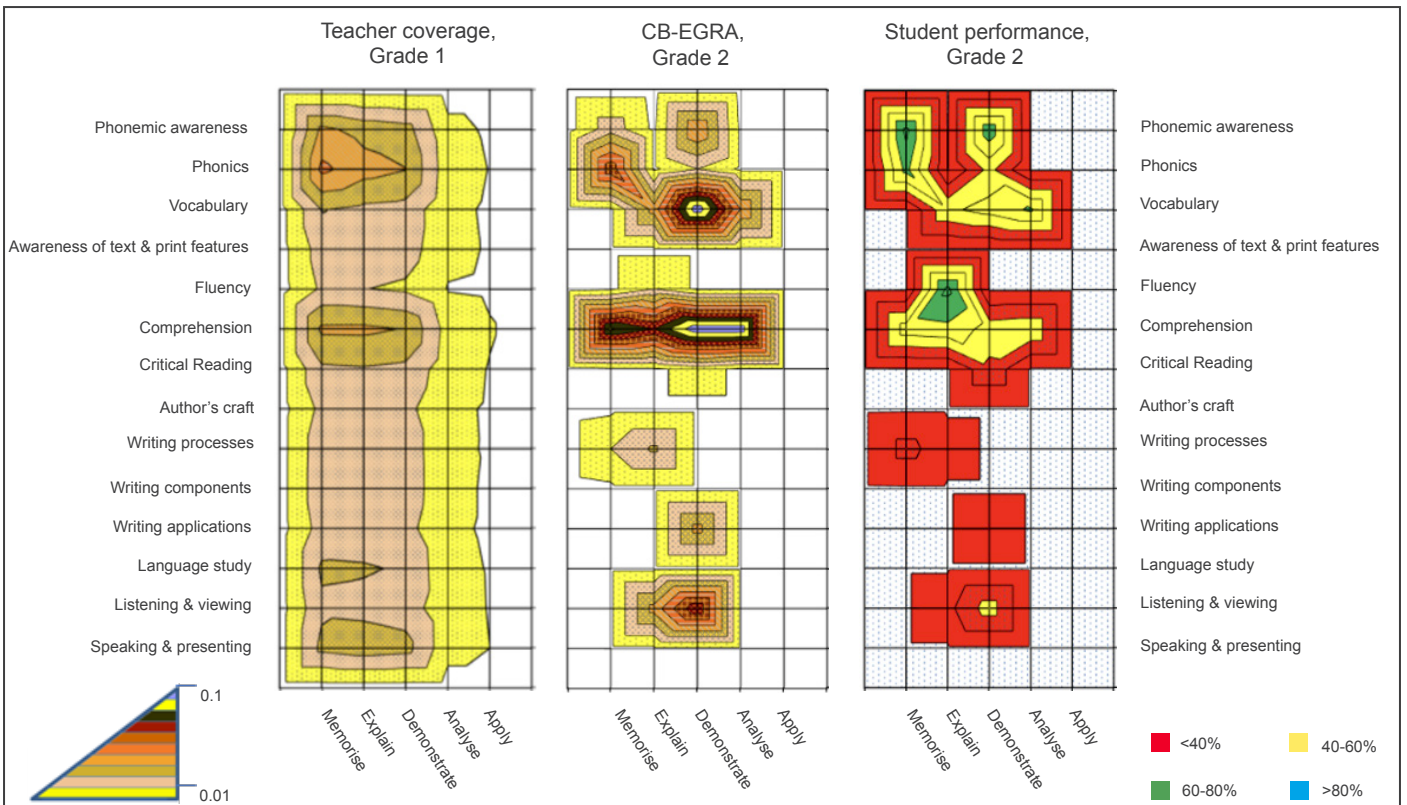

Figure 10: Topic-level alignment across Grade 1 teacher coverage, Grade 2 CB-EGRA, and baseline student performance

Source (Figures 9 and 10): Surveys of Enacted Curriculum study in Nepal, 2021-2022. Visualisations represent 3-dimensional content maps. Instructional topics are on the Y axis, levels of cognitive demand on the X axis, and level of emphasis (for CB-EGRA) or level of performance (for student performance) on the Z axis.

Discussion and Conclusion

The Integrated Curriculum for Nepali language arts and reading covers all five foundational reading skills, phonemic awareness, phonics, vocabulary, comprehension, and fluency (Comings, 2014; National Reading Panel, 2000), throughout the first three grades of primary school, with most topics covered at lower- to middle-levels of cognitive demand. In addition, Grade 1 places particular emphasis on writing processes, providing learners with pre-writing skills, and Grades 2 and 3 place additional emphasis on language study. The three grades have high levels of content alignment, which could indicate a spiral pattern in which topics are covered initially and then returned to, either later in the same grade or in a subsequent grade, providing opportunities for review and mastery among learners. This content coverage, and emphasis on reading foundations, should provide a strong opportunity for children to learn literacy skills in the early primary school grades.

Teacher instructional content in Grade 1, the grade for which we have data, shows high alignment with the prescribed IC. Similar to the curriculum, Grade 1 teachers cover a broad set of topics, including all five foundational reading skills as well as writing, language study, and speaking and presenting. At 0.63, the alignment index between teachers' instruction and the IC is high, indicating teachers have taken on the prescribed content and incorporated it into their instruction.

A potential drawback to the broad content coverage, however, for both the IC and teacher instruction, is that it spreads content thinly across many topics. This may not provide sufficient instructional time for children to master the content. Insufficient time for critical topics may not allow children to gain the depth of knowledge and skill required for later learning. Streamlining the curriculum, so that fewer topics are covered at greater depth, may provide greater opportunity for mastery. Some topics could potentially be deprioritised in the early primary grades and instead introduced after children have gained proficiency on key foundational topics.

Related to the broad spread of content on the IC is the somewhat low levels of between-grade content stretch (with alignment between grades ranging from 0.67 to 0.73). This suggests rather high levels of prescribed content repetition across grades. As is reflected in the slightly lower progression alignment measures for the CB-EGRAs (ranges from 0.56 to 0.67), the IC may need to achieve more stretch and differentiation in the between-grade content. Reducing the number of topics covered in each grade, and increasing differentiation between grades, could also provide opportunities for greater depth of content coverage at higher levels of cognitive demand. The key policy review question therefore is "how much emphasis should be given to which topic, when"?

Analysing the three instructional components, we note a clear departure by the CB-EGRAs from the other two components (IC and teachers) on both topics covered and levels of cognitive demand. The CB-EGRAs focus on a narrower set of topics and place higher emphasis on higher-order cognitive skills than both the IC and teachers. The narrow topical coverage on the CB-EGRA leaves teachers without information on student performance on other topics they are expected to cover, making it more difficult to align instruction with students' learning needs.

Children's performance on the CB-EGRA tends to be low across all topics and levels of cognitive demand assessed. In Grade 2 the highest achievement on a topic is 51 percent (corresponding to 'phonemic awareness') and in Grade 3, this was 48 percent (corresponding to 'awareness of text and print features'). This indicates that even for the topics on which students perform best, only about half can answer questions correctly.

Performance was also spread across the cognitive demand levels. The highest performance in both Grades 2 and 3 was at the lowest cognitive demand level (memorise), with grade-averages of 37 percent and 49 percent respectively. At higher levels of cognitive demand, Grade 2 students achieve grade-averages of 36 percent for 'analyse', and Grade 3 students achieved 39 percent for 'apply'.

Given that performance is low across the board, comparing students' baseline performance with the content prescribed in the new IC is tricky as even relatively high performance areas still require attention and teaching in the classroom. That being said, the relationship between students' learning needs and what is being prescribed under the new IC is complex: in some instances, students at baseline performed better at higher levels of cognitive demand than what is

prescribed in the IC. Perhaps this is the result of the IC positioning itself as a response to low learning levels; however, the alignment between children's baseline learning levels and the prescribed content should be examined to inform any needed adjustments.

Overall, the new IC covers critical language arts and reading topics at adequate levels of cognitive demand, providing strong prescribed content for children to master foundational skills. Greater focus on fewer topics may help ensure children have the time needed to achieve mastery. Teachers may need additional support to focus instruction on the topics most emphasised in the IC. Performance on the CB-EGRA indicates some misalignments between what Grade 1 students already know and what the IC intends for them to be taught, providing opportunities to better align prescribed content with students' learning needs to ensure all children achieve learning foundations.

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