Evaluated in January 2021
## Contents

1. What Does This Report Contain?  ................................................................. 3
2. Overview of the Product  .............................................................................. 3
3. Executive Summary  ....................................................................................... 4
4. Detailed Review  ............................................................................................. 8
   4.1 Content Quality  ....................................................................................... 9
   4.2 Pedagogical Alignment  ......................................................................... 11
   4.3 Technology and Design  .......................................................................... 19
Appendix  ........................................................................................................... 21
1. What Does This Report Contain?

The section, ‘Overview of the Product’, provides a brief description of the product and its key features to give the context for the evaluation. The two sections following that present the findings from the evaluation. The Executive Summary provides the overall rating and offers implications in terms of benefits and limitations for teachers and learners. The Detailed Review section provides an in-depth evaluation of the product, categorized under three dimensions (or constructs) – Content Quality, Pedagogical Alignment, and Technology & Design. For each dimension, the product is reviewed on the criteria along with explanations for the rating, and grouped into clusters. Specific examples have been provided in this report to support and elaborate on the evaluation ratings.

The terms, ‘Exemplary’, ‘Valuable’, and ‘Potential to Improve’, used in the report refer to the rating scale for evaluating the product.

- ‘Exemplary’ indicates that the product has been designed as per recommended learning theories and research-based evidence.
- ‘Valuable’ indicates limited adherence of the product’s design to the recommended learning theories and research-based evidence.
- ‘Potential to Improve’ indicates unsatisfactory or lack of adherence of the product’s design to the learning theories and research-based evidence.

2. Overview of the Product

This report evaluated the product Mindspark, Mathematics (Grades 9-10). Mindspark is an adaptive, self-learning platform aimed at providing a unique learning path to each learner based on his or her needs. It is designed using data on learners’ learning gaps and difficulties. It consists of a series of questions, activities, and challenges presented to the learner along with corresponding feedback. Adaptivity is based on learner profile and performance.
Executive Summary

Mindspark | Mathematics | Grades 9-10

Content Quality
Exemplary

Pedagogical Alignment
Valuable

Technology and Design
Valuable

Overall, the product is extremely useful for learning concepts in mathematics for Grades 9-10 due to its high content quality and is aligned with national standards. The product is strong in adaptivity and motivates learners for learning mathematics via meaningful use of context, excellent motivational features, an intuitive interface, and appropriate use of interactivity. The product supports teachers in designing assessments and for monitoring learner progress through dashboards. However, there are some areas that might create learner disengagement and conceptual gaps, such as lack of informal conversational style during content presentation, inconsistency in feedback quality, and poor error handling of the user interface. With certain improvements in pedagogical alignment and technology & design, the product will be able to effectively engage learners with the content and prepare them for tackling difficult challenges in Mathematics.

Potential benefits of this product

Learners will likely be able to:
• Develop confidence in solving complex mathematical problems due to the availability of a variety of problems and accurate solutions.
• Demonstrate mathematical skills such as argumentation, data handling, and pattern recognition as the product contains a variety of assessment questions targeting skills.
• Solve more difficult questions due to the constructive approach in pedagogy design and plenty of motivational features.
• Use Mindspark content as practice sessions / homework since it is aligned with national standards and most of the units/topics/chapters were as per NCERT books and it covers Maths skills recommended by NEP 2020.
• Track class performance as well as the learning progress of individual learners. Thus they can use the product to create and assign homework for learners.

Teachers will likely be able to:
• Use Mindspark content as practice sessions/homework since it’s aligned with national standards and most of the units/topics/chapters were as per NCERT books and it covered Math skills recommended by NEP 2020.
• Track class performance along with individual learner’s learning progress. Thus they will likely use the product to create and assign homework for learners.
Potential limitations of this product
Learners will likely face the following issues:

• Feel disengaged with the content or drop out due to lack of conversational style in presentation, lack of sufficient scaffolding, lack of self-paced navigation.
• Get frustrated as recovery from errors is missing in the product. Moreover, no guidance for revisiting the content is provided in the feedback.
• Feel demotivated due to the drop in accuracy if they revisit the content.

Mindspark (Grades 9-10): Summary of Review Ratings by Criteria

Content Quality: Exemplary 😊

C1 Content accuracy
Not applicable as the product did not contain separate content videos or text; instead “content” in the product was entirely in the form of questions.

C2 Correctness and clarity in assessment
All the assessment questions and their solutions are factually correct and unambiguous.

C3 Language comprehensibility
The sentences and vocabulary are easy to understand and the phrasing is simple.

C4 Mathematics skill coverage
Skills recommended by the NEP like graphical representation, abstract concepts, understanding shapes & patterns are covered well.

C5 Curriculum alignment
The content is aligned to NCERT and logically sequenced.

C6 Inclusivity in representation of learners
An attempt has been made to include representation of relevant sections of Indian society across gender, religion, socio-economic class etc. However, the rural sections of society have been missed out, leading to an inadequate representation.

Pedagogical Alignment: Valuable 😊

P1 Constructivist approach
Elements of constructivist approach are present such as a well-sequenced set of diverse questions, and activities where the learner gets an opportunity to experiment.

P2 Addressing learning gaps/ alternate conceptions
Through the questions, all different possibilities have been explored and explained, hence addressing and potential learning gaps.
### P3 Content in context
Relevant and sufficient context is provided across the product.

### P4 Learner scaffolding
Effective learner scaffolds such as diagrams, animations, and drop boxes were provided in some units, although they were inconsistent across topics.

### P5 Cognitive engagement
Appropriate visual cues were provided, although conversational style was still formal, and in third person.

### P6 Motivational features
The product includes a comprehensive set of motivational features that are well integrated and prompt the learners to interact further with the content. Eg Sparkies, leaderboards, badges etc.

### P8 Learning objective – assessment alignment
All learning objectives have assessment questions aligned at corresponding cognitive levels.

### P9 Pedagogy – assessment method alignment
The pedagogical strategies used in the product and the assessment methods used are aligned to each other across all the topics.

### P10 Cognitive levels covered
HOTS are being sufficiently addressed in the content, examples or activities.

### P11 Feedback Quality
Appropriate feedback is provided through complete explanations and visuals, although it lacks consistency across topics.

### P13 Adaptivity
The product is assessment adaptive, and the adaptivity is determined on the basis of learner profile and performance.

### P14 Teacher support
Adequate teacher support is provided, where they can customize and assign students relevant material.

---

**Technology and Design: Valuable 😊**

<table>
<thead>
<tr>
<th>T1 Interface design: Enable intuitive use</th>
</tr>
</thead>
<tbody>
<tr>
<td>The interface is intuitive to use, all elements are clearly visible and actions are mapped to their expected response.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>T2 Interface design: Assess consequences of an action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfaces provide feedback to the learners action, but does not facilitate error recovery.</td>
</tr>
<tr>
<td>T3 Learner navigation &amp; pace</td>
</tr>
<tr>
<td>----------------------------</td>
</tr>
<tr>
<td>T4 Universal Design</td>
</tr>
<tr>
<td>T5 Analytics for learners’ progress</td>
</tr>
<tr>
<td>T6 Tools to support problem solving</td>
</tr>
<tr>
<td>T7 Meaningful interactivity</td>
</tr>
</tbody>
</table>
4. Detailed Review

4.1 Content Quality 😞
Content Accuracy and Clarity ................................................................. 9
Alignment to National Standards .......................................................... 10
Inclusivity in Content Representation .................................................. 10

4.2 Pedagogical Alignment 😊
Learner-Centred Approach ................................................................. 11
Enhancing Learner Experience ............................................................. 13
Assessment of Learning ...................................................................... 17
Adaptivity ............................................................................................... 18
Teacher Support ..................................................................................... 18

4.3 Technology & Design 😊
User Interface Design .......................................................................... 19
Affordances that Facilitate Learning .................................................... 20
4.1 Content Quality

Content Quality measures the accuracy and content/skill coverage for the grade targeted and the specific domain. This dimension focuses on content accuracy and clarity, alignment to national standards, and inclusivity in content representations.

4.1.1 Content Accuracy and Clarity

Note: This product consisted of a series of questions for the learner and corresponding feedback based on the learner’s response. The “content” in the product was entirely in the form of “questions” and it did not contain separate “content” videos or text. Hence the criterion Content accuracy (C1) is not rated separately here.

Correctness and clarity in assessment (C2) is rated Exemplary. The assessment questions and their solutions contain correct facts. The explanation for solutions is complete and conveys the required concept accurately. (Fig.1)

Illustrative example: Topic: Linear equation in two variables; Grade 9

Language Comprehensibility (C3) is rated Exemplary: The content is easy to comprehend for learners of Grades 9-10. Short and simple sentences are used and learners need not spend extra time figuring out the content of the question or solution. In rare instances, students may face difficulty in comprehension due to its representation.
4.1.2 Alignment to National Standards

**Mathematics Skill coverage** (C4) and **Curriculum alignment** (C5) are both rated Exemplary:

Major topics are chunked appropriately into small subtopics and the conceptual understanding of the topics is progressively built through a series of questions. It is observed that, broadly, all the topics and sub-topics covered were aligned with the content present in NCERT textbooks for Grades 9-10. The sub-topics are scaffolded in order of their difficulty levels and prerequisite knowledge required within each topic. Similarly, it was observed that the content covers all the Math skills recommended by NEP and NCF specifically for the upper primary stages (Grades 9-10) such as argumentation and proof writing, reasoning about shapes, mathematical modeling, data analysis and interpretation, etc. The product covers proofs of the Pythagoras theorem stepwise and also provides an opportunity for students to complete steps or select the answer in steps. Data analysis, and interpretation are covered through topics of central tendency where students calculate various values.

4.1.3 Inclusivity in Content Representation

**Inclusivity in the representation of learners** (C6) is rated Valuable: There are efforts to include content relatable to diverse learner groups in terms of gender, race, socio-economic class, religion, looks, etc. But many examples. However, the examples mostly target urban and semi-urban areas and learners from rural areas might not be able to find sufficient connection to real-life examples.

**Illustrative example:** Topic: Representation of data, Grade 9

There were some common examples provided for plotting data like production of lamps in the factory, test marks of the students, range of highest temperature etc. But there were examples like 10 songs in the billboard chart and names and singer shown in fig.2.
4.2 Pedagogical Alignment

Pedagogical Alignment focuses on Adaptivity, learner-centered pedagogy, enhancing learner experience, assessment of learning, and teacher support. It measures the extent of alignment of the pedagogical strategies with national educational policies, Learning Sciences theories and design principles to create a meaningful learning experience.

4.2.1 Learner-Centred Approach

Constructivist approach (P1)  
Addressing learning gaps (P2)

Constructivist approach in pedagogy design (P1) is rated Exemplary: In the product, many opportunities are available to learners to construct their understanding of the topic. Learning activities provide the opportunity to experiment and test the results. For example:

Illustrative example: Topic: Trigonometric ratios, Grade 10

There is an activity where students are provided with a button to click and find the angle of elevation in a given problem. Then they are also given an option button to decide which two sides to be considered for a particular ratio (sin, cosine, or tan).(Fig.3) Such activity helps learners to construct knowledge. Many such activities are available in this particular unit which can strengthen the conceptual understanding of complex concepts.

![Fig.3. Opportunity to vary angle of elevation](image)

There are well-sequence and diverse assessment questions that help learners to build knowledge structures.
Illustrative example: Topic: Proof of Pythagoras theorem, Grade 10

The diverse assessment questions as shown in fig.4 are based on identification of congruent triangles, use of congruence principle to find ratio of sides and then find relation between hypotenuse of right angle triangle and its sides. Then a complete proof of Pythagoras theorem is explained.

Fig.4.series of questions to build proof of Pythagoras theorem

Addressing learning gaps/ alternate conceptions (P2) is rated Exemplary: In most of the topics, the learning gaps are addressed through various diverse examples.

Illustrative example: Topic: Volume and surface of a cylinder, Grade 9

The calculation of the surface area of a closed cylinder is explained and there is a question based on the calculation of surface area if one end is closed. This directs learners' attention towards the alternate possibility of considering only one end of the cylinder during calculation. The solution provided for the question addresses this learning gap through explanation (Fig. 5 & 6)

Fig.5.Identification of gap Fig.6.Redressal of learning gap
**Illustrative example: Topic: Graphical representation of data, Grade 9**

The concept of break (kink) in the histogram is explained using an appropriate diagram and the question based on marking of kink in the given data is posed to the learners. The solution explains the reason for marking break in histogram for given data. (Fig. 7)

**4.2.2. Enhancing learner experience**

<table>
<thead>
<tr>
<th>Content in Context (P3)</th>
<th>Learner scaffolding (P4)</th>
<th>Cognitive Engagement (P5)</th>
<th>Motivational Features (P6)</th>
</tr>
</thead>
</table>

**Content in Context (P3) is rated Exemplary:** Sufficient real-life examples are given based on topic requirements.

**Illustrative example: Topic: Introduction to heights and distance, Grade 10**

The question is based on the calculation of the angle of elevation:
- A situation is given, for instance:
  - An archer on a fort targeting the enemy. Learners are supposed to find the angle of elevation. (Fig. 8)

A boy flying the kite at a particular angle. Students need to find the length of the string. (Fig. 9)

A little boy is flying a kite. The string of the kite makes an angle of $35^\circ$ with the ground. If the height of the kite is $h = 25$ m, find the length of the string that the boy has used.

The length of the string of the kite = $43.58$ meters

Calculate your answers up to 2 decimal places only.
Illustrative example: Developing and using the formula for the surface area of a cylinder, Grade 9

For example, the rolling of a paper sheet into a cylinder to explain surface area creates the appropriate context for students. (Fig.10)

![Fig.10.Rolling of paper to make cylinder]

Many such examples relating to real-life situations are found across various topics for 9-10 in the product.

**Learner Scaffolding (P4) is rated Valuable:** There are various scaffolds available in the product, but their appearance is inconsistent. In some of the learning units, problem solving steps are given. In the problem solving table, graph paper (fig.11), option boxes (fig.12) etc. are provided as scaffolds.

Illustrative example: Linear equations in two variables, Grade 9

The question is “Given linear equation 4x+2y=20, Which of the following points would lie on the line formed?” In order to simplify the problem-solving task a table and a graph paper are provided. If learners write numbers in the table then, immediate feedback is given about its correctness. Based on points specified in the table, a line is drawn on the graph (Fig.11).

![Fig.11.Table and graph as scaffold]
Illustrative example: Topic: Proof of Pythagoras theorem, Grade 9

Problems based on proof are presented in steps and learners are required to fill the blank places in those steps. To fill the blank places, multiple options are given (Fig.12).

![Illustrative Example](image)

Fig.12. Multiple options provided in the orange box as scaffold

But there are many other learning units where no scaffolds are provided (Fig. 13 & 14). The questions are given directly without hints or any clues for attempting the problem.

Illustrative example: Topic: Problems on Pythagoras theorem, Grade 10

Harish moves 60 metres northwards and then 45 metres eastwards to reach a landmark. Vikas moves 15 metres westwards and then 20 metres southwards to reach the same landmark. What is the straight line distance between the starting positions of Harish and Vikas?

Answer: 75.166 metres

Fig.13. No scaffolds

Illustrative example: Topic: Introduction to linear equations in two variables, Grade 9

In Fun Amusement Park, with the entrance ticket one gets 5 complimentary rides on either the ‘Columbus’ or the ‘Black-Hole’.

If $p$ is the number of complimentary rides on the Columbus and $q$ on the Black-Hole, then which of the following is always true about $p$ and $q$? (Assuming that one uses all the complimentary rides)

- $pq = 5$
- $p + q = 5$
- $p = q = 5$

Fig.14. No scaffolds
Cognitive Engagement (P5) is rated Valuable: In this product, many visual cues are provided in the form of diagrams. For example, in Fig. 15, the sector of a circle whose surface area needs to be calculated is highlighted.

Motivational Features (P6) is rated Exemplary: Noteworthy motivational features for the learners are seen such as Sparkies, challenge questions, effort mode, leaderboards, as well as rewards such as ‘Captain Right Angled’ (Fig. 16). Those features prompt the learner to further explore and engage with the content.

Animation is provided in solutions for calculating the surface area of a cylinder. But a personalized conversational style is not seen in any topic. Formal book language is used for question and solution presentation. Questions are still in the third person and don’t necessarily invite the learner to engage deeply with the problem.
4.2.3 Assessment of Learning

<table>
<thead>
<tr>
<th>Learning objective - assessment alignment (P8)</th>
<th>Pedagogy-assessment method alignment (P9)</th>
<th>Coverage of cognitive levels (P10)</th>
<th>Feedback quality (P11)</th>
</tr>
</thead>
</table>

**Learning objective – assessment alignment (P8) is rated Exemplary.** The questions in each topic and concept are very well aligned with the learning objective.

**Pedagogy-assessment method alignment (P9) is rated Exemplary:** The product mostly contains direct assessment questions in increasing order of difficulty level. There are questions that are likely to help develop learners' argumentation skills. For instance, students are asked to prove different properties of the median of the triangle by using the Pythagoras theorem. For example,

**Illustrative example: Topic: Introduction to heights and distances, Grade 10**

Calculation of the distance between two houses where a church is the common point for the angle of elevation from both houses. Students need to use trigonometry concepts as well as model the given situation using diagrams (Fig. 17)

There is a church of height 350 m in a town. The angle of elevation of the top of the church from Sanjay's house is 30° and from Varun's school is 45°. The house and school are on the same side of the church and all 3 buildings lie along the same line. What is the distance between Sanjay's house and Varun's school? (Take \( \sqrt{3} = 1.732 \) and assume that the height of the observer is negligible)

Answer: 256.20 m

**Fig. 17. Problem for mathematical modelling**

Many such situational problems are available in various topics such as surface area calculations, Pythagoras theorem, trigonometry, etc. This shows an alignment between assessment and pedagogy. The nature of the product is such that most of the assessment is direct and explicitly question-based (as opposed to implicitly based on activities.)

**Cognitive levels covered (P10) is rated Exemplary:** The questions are present at various cognitive levels, ranging from recall to analysis level. A large number of questions are present at an ‘apply’ level.
Feedback Quality (P11) is rated Valuable: Although in many places the feedback quality is great. The solution is made comprehensive through animations, visual representations, and step-by-step explanations. However, it misses two critical aspects:

1. Maintaining consistency of quality across all questions and topics
   The quality of feedback varies across various questions. In some questions, the feedback is binary. For example, in problems based on the graphical representation of data, only the answer is mentioned for the first few questions. No steps or additional explanations are provided. In challenge questions, no feedback is provided if the answer is incorrect.

2. Providing constructive feedback to the learner based on their response
   In some of the topics where the stepwise solutions are provided and especially in remedial work, learners are given options to choose steps. Feedback is provided based on the steps taken. However, it is not constructive as the same feedback is given for correct as well as incorrect steps.

4.2.4. Adaptivity

Adaptivity (P13) is rated Exemplary: The product is assessment adaptive. Adaptivity is based on the performance of the learner. Although question difficulty and type of questions change based on previous answers, some of the things are missed out as the interaction is not captured. For example, random answers or guess-based answers, or the time spent on each question. Sometimes the accuracy still turns out to be 50% despite guessing all answers and that fails to capture the learning gaps effectively (for both the student and teacher). Despite this shortcoming, the review team has rated this criterion as exemplary due to the overall effectiveness of the product’s adaptivity.

4.2.5 Teacher Support

Teacher support (P14) is rated Exemplary. Robust mechanisms to create homework, worksheets, and dashboards to track student progress are available. Teachers can create and customize their questions or use textbook questions. They can choose individual topics for particular students and curate personalized student journeys, plus track class performance at an aggregate level.
4.3 Technology and Design

Technology & Design measures how well the technological affordances and the user interface design integrate with the pedagogy and context to promote a meaningful learning experience for all learners. The criteria in this dimension focus on user interface design and affordances that facilitate learning.

4.3.1 User Interface Design

<table>
<thead>
<tr>
<th>Interface design (T1 and T2)</th>
<th>Learner navigation and pace (T3)</th>
<th>Universal design (T4)</th>
</tr>
</thead>
</table>

**Interface design: Enable intuitive use (T1) is rated Exemplary.** The user interface follows Norman’s design principles for visibility, affordance, consistency, and mapping. The interface clearly conveys how learners need to perform actions.

**Interface design: Assess consequences of an action (T2) is rated Valuable.** The user interface does not facilitate error handling effectively. For instance, if a learner clicks on an answer option by mistake, the choice is selected and the associated explanation pops up without giving the learners a chance to correct their actions. There were also instances where error messages are displayed as Null or not as complete meaningful sentences.

**Learner Navigation and pace (T3) is rated Valuable.** Based on the learner’s response to questions, the system decides the learner’s path but does not always give the learner enough control over their learning process. The learner is prevented from going back and forth within the learning unit. Also, movement between learning units is restrictive i.e., once a learner completes one unit of a chapter, the product allows the learner to go to the next unit but the learner cannot move back to the previous learning unit.

**Universal Design (T4) is rated Valuable:** The product does not have a low entry barrier for diverse learners such as those with varying abilities, learners with special needs, or other characteristics. Non-keyboard alternatives enabling a user to provide inputs are missing (for example an onscreen keyboard). However, several Web Content Accessibility Guidelines (WCAG) principles have been followed, such as content being presented in different ways such as textual, diagrams, and simulations. Content is allowed to appear and be operated in predictable ways.
4.3.2 Affordances that Facilitate Learning

<table>
<thead>
<tr>
<th>Analytics for learners’ progress (T5)</th>
<th>Tools to support problem-solving (T6)</th>
<th>Meaningful Interactivity (T7)</th>
</tr>
</thead>
</table>

**Analytics for learners’ progress (T5) is rated Valuable:** The product has a teacher dashboard which is great in terms of the information it presents to the teacher and can help guide a teacher’s instruction in the classroom. For example, it shows every learner’s learning trail including the topics and questions which they solved, as well as the overall performance on different topics. The teacher can also see the overall class performance on various topics and subtopics. However, it does not provide sufficient guidance to the teacher on identifying where the learner needs to put in more effort, or where additional support should be provided to make progress. For example, the dashboard doesn’t allow teachers to assign different topics or questions, or activities to specific sets of students based on their performance or interaction with the system. There is, however, a possibility to activate or deactivate a particular topic for the entire class. The student dashboard lacks a display of the learner’s progress. Direct navigation from the dashboard to an in-progress topic is not provided. Topic-wise dashboards do provide indicators for accuracy, what a learner has mastered, and access to completed questions with explanations.

**Tools to support Problem-solving (T6) is rated Exemplary:** No specific Math-related tools (like rulers, clocks, etc.) have been found for this Grade range.

**Meaningful Interactivity (T7) is rated Exemplary:** The interactivity affordance of the product is of good quality. In many places when required and possible, there are meaningful activities where the learner can interact with the system. They are implemented using different ways like text inputs, drag-and-drop, etc. A good example of interactivity is in the topic of the Pythagoras theorem where learners are allowed to input values from a given box to complete the proof. A drag and drop feature is available for completing the proofs.
Appendix

How does the EdTech Tulna evaluation work?

FRAMEWORKS

EdTech Tulna frameworks define a set of standards for quality design of EdTech products. A rigorous and research backed process is established and applied for the creation of various nuanced frameworks. These frameworks are use-case specific to enable transparent and precise, high stakes decision making. The process includes considering existing research literature, feedback from the ground on multiple stakeholder needs and an appreciation for the quality of solutions currently supplied in the ecosystem.

The frameworks are categorized along the three dimensions of Content Quality, Pedagogical Alignment, and Technology & Design to capture a holistic view of the quality of the product design. The frameworks are also made available at varying levels of depth for varying stakeholder needs and range from supporting governments and institutions in making high stakes, rank based, adoption decisions, to providing a brief overview of the key criteria to be considered while designing a product.

TOOLS

Each Tulna framework is accompanied by a toolkit that is specifically designed to guide experts to evaluate EdTech products. These toolkits are customized to the type of EdTech solution, grades, subjects, to drive meaningful and nuanced evaluations. The tools are informed by research as well as iterative empirical study and tested for inter-rater reliability and validity. A typical toolkit consists of rubrics and reviewer guidelines to enable evaluators to interpret the framework and conduct unbiased evaluations. Each criterion within the framework is rated along a three-point rating scale - 'Exemplary', 'Valuable', and 'Potential to Improve' - indicating the level of alignment with expectations laid out in the framework. Toolkits include supporting materials - videos, templates, and example illustrations - to guide experts while conducting evaluations.

PROCESS

Each product goes through a rigorous review process that takes approximately 160 hours for four grade ranges K-2, 3-5, 6-8, and 9-10. Each review team is designed to be independent and neutral. A typical expert review team consists of 3-4 members who are subject matter experts, instructional designers, user-interaction experts, user-experience design experts, and professionals with experience in teaching and implementing EdTech in field settings. Each review team has an anchor of at least one experienced evaluator.

Each member of the expert review team undertakes a two-week long intensive training on understanding the frameworks and the subsequent application of its toolkits to conduct evaluations. For each product, the review team applies a systematic sampling strategy and decides the representative learning units that will be reviewed. The team collectively reviews a subset of the learning units to check for convergence and establish inter-rater reliability. Team members then individually review the remaining learning units. The team finally meets to synthesize key points and takeaways of each review and elaborates their reviews into an in-depth report, which is overseen by the experienced evaluator.

The role of the product company is limited to an initial demo which supports the review team to deepen their appreciation of the intended use of the product, and its scope. The product company is then provided the final reviews and their unedited responses are published alongside the expert evaluations on the Tulna evaluation center.