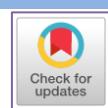


## Evaluation of the literacy and numeracy strengthening program in elementary schools of Kemandren Tegalrejo



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**Abstract:** Literacy and numeracy skills are core competencies in determining students' academic achievement and lifelong learning. Elementary schools in Tegalrejo District have implemented literacy and numeracy strengthening programs for the past two years. However, an evaluation of the program has not been conducted. Based on this, this study aims to evaluate the implementation of the literacy and numeracy strengthening program in nine elementary schools in Tegalrejo District using the CIPP evaluation model. Data collection was conducted through surveys, interviews, observations, and document analysis. The results of the study indicate that the strengthening program is effective in strengthening students' literacy and numeracy skills in general, aligned with school needs, supported by appropriate policies, and strengthened by the active involvement of stakeholders, especially principals and teachers. Investments in teacher training and the provision of facilities such as reading corners and numeracy materials have contributed to a more effective learning environment, despite minimal parental involvement. Literacy and numeracy activities are also supported by collaborative innovation and consistent monitoring by the relevant schools. The product evaluation also showed improvements in student competency, a more dynamic school literacy and numeracy culture, and increased publication of student and teacher work. The findings of this study have highlighted the importance of (1) careful planning of numeracy literacy strengthening programs, (2) ongoing professional development for teachers, (3) collaboration between stakeholders such as principals and parents, and (4) systematic evaluation to measure the effectiveness of literacy and numeracy strengthening programs in primary education.

**Keywords:** Program Evaluation; Literacy and Numeracy ; Elementary School.

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### INTRODUCTION

Literacy and numeracy are fundamental to academic success and lifelong learning, particularly at the elementary school level. Evidence from international studies shows that high levels of literacy and numeracy significantly contribute to students' academic achievement and future employment opportunities (Holm 2025; Jerrim et al., 2023; Marks & O'Connell 2021; Permatasari et al., 2024). In Indonesia, the government has undertaken various initiatives to strengthen literacy and numeracy through the implementation of integrated strengthening programs within the elementary school curriculum (Kementerian Pendidikan 2021; Komara & Hadiapurwa 2023; Laila et al., 2025; Mujinem et al. 2021; Saptono et al., 2023). These programs aim to improve students'

basic reading, writing, and arithmetic skills, thus providing a foundation for successful learning at subsequent levels of education.

However, other results indicate that many challenges remain in implementing literacy and numeracy strengthening programs, particularly in elementary schools, such as (1) limited teacher pedagogical skills, (2) lack of teaching materials, and (3) lack of parental involvement (Firmansyah et al. 2024; Pratikno et al., 2024; Santillan, 2023; Sunardianta et al., 2024; Tomas et al., 2021). These results are reinforced by the disparity between urban and rural schools in terms of access to resources and learning outcomes, which leads to inequality in student achievement (Terrin & Triventi 2023) especially in the 3T (underdeveloped, frontier, and outermost) regions of Indonesia.

**Table 1.** Literacy and Numeracy Levels in Indonesia (PISA 2012–2022)

Year	PISA Score		Top 1–5 Countries (Numeracy)	OECD Average
	Literacy Score (%)	Numeracy		
2012	46%	396	570–580 (Shanghai-China, Hong Kong, Singapura, Jepang, Korea)	496
2015	46%	397	535–543 (Singapura, Hong Kong, Kanada, Finlandia, Irlandia)	493
2018	30%	371	526–555 (Beijing-Shanghai-Jiangsu-Zhejiang, Singapura, Makau, Hong Kong, Estonia)	487
2022	23%	359	543–555 (Singapura, Irlandia, Jepang, Korea, Taiwan)	476

The results of the PISA and AKSI assessments of Indonesian students' literacy and numeracy skills remain below the average for developing countries (Astuti et al., 2023; OECD 2023). This reflects a suboptimal level of literacy and numeracy competency achievement. Low assessment results indicate the need for strategic government efforts, including program evaluations, to ensure that schools effectively implement existing programs to improve students' basic skills.

Based on these issues, evaluations of literacy and numeracy strengthening programs are necessary to map the program's strengths and weaknesses. This aligns with Alkin's findings in his book, which states that effective evaluation not only assesses student achievement but also examines various factors that influence program effectiveness, such as (1) resource availability, (2) teacher competence, and (3) classroom learning implementation (Christie & Alkin 2023). In the context of this research, evaluation serves as a key instrument for continuous improvement of the education system.

This research establishes evaluation as a key instrument for sustainable program improvement, particularly in the Tegalrejo District. One widely used and recognized effective evaluation approach in the educational context is the CIPP (Context, Input, Process, Product) evaluation model. This model offers a comprehensive framework for assessing various aspects of a program, from (1) context and needs analysis, (2) availability of inputs or resources, and (3) process implementation, all the way to final program outcomes (Chang & Wang 2024; Stufflebeam & Zhang 2017). Through the CIPP model, periodic and objective evaluations can be conducted regarding the adequacy of resources, teacher competency, and the quality of ongoing learning processes, allowing for a more comprehensive measurement of the effectiveness of literacy and numeracy programs (Firmansyah et al., 2020; Isnaeni et al., 2024; Sidik & Firmansyah 2020).

Evaluating literacy and numeracy strengthening programs is crucial to determine the extent to which they align with government standards and impact student learning outcomes. Previous research has emphasized the importance of ongoing program evaluation to support improvements in educational quality (Firmansyah et al., 2020). Therefore, the research questions in this study are outlined as follows: (1) What are the results of the context evaluation of the literacy and numeracy strengthening program in the Tegalrejo Sub-district?; (2) What are the results of the input evaluation of the literacy and numeracy strengthening program in the Tegalrejo Sub-district?; (3) What are the results of the process evaluation of the literacy and numeracy strengthening program in the Tegalrejo Sub-district?; and (4) What are the results of the product evaluation of the literacy and numeracy strengthening program in the Tegalrejo Sub-district?

## **METHODS**

This study aims to evaluate the implementation of an educational program using the CIPP (Context, Input, Process, Product) model developed by Stufflebeam. This model was chosen because it offers a comprehensive perspective, starting from identifying needs (context), assessing readiness and resource availability (input), observing the implementation process (process), and analyzing the achieved outcomes (product) (Stufflebeam & Zhang 2017). This approach ensures that the evaluation includes not only measurable aspects of program implementation, but also contextual, procedural, and output factors that contribute to the program's overall effectiveness.

**Table 2.** Evaluation Criteria for the Literacy and Numeracy Strengthening Program in Kemantran Tegalrejo

Stage	Evaluation Criteria	Indicators
Context	Alignment with school needs	Program aligns with school needs, student environment, and initial assessments.
	Policy support	Existence of policies supporting literacy and numeracy (GLS, Sekolah Penggerak, Merdeka Curriculum)
	Stakeholder involvement	Active involvement of principals, teachers, committees, and parents
Input	Human resources	Principals, teachers, and staff trained in literacy and numeracy
	Facilities and infrastructure	Availability of reading corners, leveled books, numeracy materials, library support
	Financial support	School budget allocated for literacy and numeracy
Process	Learning implementation	Integration of literacy and numeracy into intra-, co-, and extra-curricular activities.
	Collaboration and innovation	Team teaching, project-based learning, community or partner involvement.
	Monitoring and evaluation	Regular assessments, surveys, reflections.
Product	Improvement in student competencies	Improvements in literacy and numeracy outcomes (AKM, PISA, surveys)
	Changes in school culture	Growth of literacy culture, increased reading, exhibitions, community involvement
	Publications/results	Student and teacher work published

The research design adopted a descriptive-evaluative framework with a mixed-methods approach, integrating quantitative and qualitative data to ensure a holistic understanding. This methodology enabled the study to capture not only statistical indicators but also rich narratives, lived experiences, and dynamic interactions among

stakeholders in the field. Data collection methods included surveys to gather extensive quantitative information, in-depth interviews to explore participants' perspectives, direct observation to document current practices, and document analysis to verify alignment between policy and practice.

The research sites were selected purposively to ensure that participating schools accurately represented the diverse contexts in which the program operates. All key stakeholders in the selected schools, including principals, classroom teachers, and students, were comprehensively involved through a totalitarian sampling technique, maximizing the inclusivity and representativeness of the study. Conducted in nine elementary schools in the Tegalrejo sub-district, the findings of this study are expected to provide a nuanced and comprehensive picture of the effectiveness and challenges of the Literacy and Numeracy Strengthening Program from various perspectives within the elementary school environment. Ultimately, the insights generated from this evaluation are intended to inform evidence-based policy decisions and support the continuous improvement of similar education programs.

## **RESULT AND DISCUSSION**

### **Result**

#### **Context Evaluation of the Literacy and Numeracy Strengthening Program**

The context evaluation phase of the literacy and numeracy strengthening program in elementary schools in the Tegalrejo area showed that most schools developed programs based on mapping the actual needs of their educational units and the results of initial student assessments. The district's official program plan stipulates that each school conduct a detailed initial needs assessment in accordance with applicable guidelines. Each school identified student characteristics, including (1) socioeconomic background, (2) interests, and (3) learning challenges. For example, several schools found that a large proportion of students came from low- to middle-income families, necessitating specific strategies to increase motivation and participation in literacy and numeracy learning. In a teacher survey, 65% agreed that economic factors significantly impacted student engagement in literacy and numeracy activities. Furthermore, it was found that some students in early grades had not yet fully mastered basic reading and numeracy skills. During classroom observations, evaluators noted that many first and second grade students struggled with simple reading tasks, reflecting this skills gap. Meanwhile, in upper grades, prominent issues included difficulty understanding word problems and completing more difficult numeracy tasks.

The needs mapping efforts undertaken by schools in Tegalrejo Sub-district align with the Ministry of Education's Literacy and Numeracy Strengthening Guidelines, which emphasize the importance of aligning programs with initial assessment results and students' specific characteristics and needs. A review of national guidelines and district program manuals confirmed the emphasis on data- and needs-driven program design. Schools also began considering aspects of the learning environment, not only from a physical perspective such as (1) the availability of reading corners, (2) literacy spaces, and (3) numeracy teaching materials, but also from a socio-emotional perspective. Evaluators also observed that four of the six schools had dedicated reading corners with graded books and math teaching aids in the classroom, demonstrating a focus on the learning environment. The schools' strategic plans and Ministry of Education directives explicitly recommend differentiated learning and inclusive literacy support

programs. For example, one principal described the establishment of an after-school reading club for those struggling with reading. *"We started a reading clinic to help those who need extra support,"* she said, illustrating this emphasis on support.

**Table 2.** Average Context Evaluation Score for the Implementation of the Literacy and Numeracy Strengthening Program

No.	Indicators	Average	Decision
1.	Alignment with school needs	3,75	Appropriate
2.	Policy support	4,00	Highly Appropriate
3.	Stakeholder involvement	3,25	Moderately Appropriate

The survey results showed that 78% of teachers stated that existing literacy and numeracy strengthening programs were aligned with literacy needs, but only 56% considered numeracy integration to have been implemented optimally. Interviews also highlighted similar concerns. *"Most children in the early grades are not yet fluent readers, so this literacy program is absolutely necessary,"* said a Grade 2 teacher. Table 2 presents the average context evaluation scores for the three main indicators. The analysis shows that the program's alignment with school needs received an average score of 3.75 (categorized as "Appropriate"), was fully supported by school regulations (average score of 4.00), and stakeholder engagement was deemed quite appropriate. Meetings with the school committee indicated moderate stakeholder engagement, as parents and teachers collaborated on literacy activities.

#### Input Evaluation of the Literacy and Numeracy Strengthening Program

The input evaluation indicated that many principals, teachers, and educational staff had access to literacy and numeracy training and mentoring. 90% of teachers reported attending at least one literacy/numeracy workshop in the past year. A series of workshops and training sessions were held, often led by district-level literacy specialists. Evaluators also observed numeracy training sessions where teachers actively collaborated on developing new mathematics lesson plans. The 2024 professional development schedule confirmed that quarterly workshops on literacy and numeracy pedagogy were held. These opportunities were generally well-received, although some teachers noted that additional follow-up support could strengthen implementation. *"The training on new reading strategies was helpful, but we need more in-class training afterward,"* commented a Grade 2 teacher.

**Table 3.** Average Input Evaluation Score for the Implementation of the Literacy and Numeracy Strengthening Program

No	Indicators	Average	Decision
1.	Human resources	3,63	Appropriate
2.	Facilities and infrastructure	3,25	Appropriate
3.	Financial support	3,50	Appropriate

Most schools have established literacy environments rich in printed teaching materials. For example, all schools have developed reading corners and collections of leveled books in libraries or classrooms. 68% of teachers agree that their school's reading corners have an adequate supply of books. Basic numeracy teaching materials are available, but the quality and quantity vary across schools. *"We only have two sets of fraction tables for 30 students,"* lamented one teacher, who also emphasized the need for more numeracy resources. Some schools also reported a shortage of the latest leveled reading books and advanced math aids. School inventory records show that

although book collections met targets, only half of schools purchased new math devices last year.

Financial support for this program is provided through a combination of school funds and external grants. The 2023 budget report confirms that each school allocates funds from its annual budget for library books and teaching aids to support the literacy and numeracy strengthening program. In general, most schools allocate a portion of their annual budget specifically for literacy and numeracy activities. Seventy percent of principals agreed that their budget allocation for literacy and numeracy is sufficient to meet the program's basic needs. However, funding adequacy is a concern. "We often have to ask parents to donate books because the budget is insufficient," reported one teacher, explaining the funding gap. Several teachers noted that available funds only cover basic needs. In some schools, evaluators observed the use of homemade or recycled teaching materials, reflecting the need to compensate for budget constraints.

#### Process Evaluation of the Literacy and Numeracy Strengthening Program

The process evaluation phase showed that schools actively integrated literacy and numeracy activities into classroom learning. Teachers frequently used participatory and contextual strategies, such as (1) group discussions, (2) storytelling, and (3) math practice. 82% of teachers reported regularly integrating at least one literacy or numeracy activity into their daily lessons. In one observed math class, students used blocks to solve word problems, an example of a numeracy reinforcement practice strategy. Students collaborated with visual aids to solve math problems during the observed lesson. Some schools introduced special initiatives such as reading clubs or math clubs as extracurricular activities. "We formed a small library club that meets twice a week to encourage reading," explained a Grade 4 teacher, highlighting such a program. The quality of implementation varied across schools; although many students were well-engaged, some teachers persisted in traditional lecture methods. Sample lesson plans from high-performing schools included a variety of group projects, while plans from some other schools showed limited interactive activities.

Teacher collaboration and community involvement in this process were moderate. Many teachers engaged in team teaching, project-based learning, and collaboration with school or community partners to support Literacy & Numeracy learning. 45% of teachers reported regular co-planning or team teaching with colleagues. Two schools had formal memorandums of understanding (MOUs) with local NGOs to support reading programs, indicating community partnerships. In some schools, this collaboration extended to community involvement in literacy and numeracy strengthening, for example, through book drives and exhibitions. Evaluators attended a "Math Fun Day" where student volunteers led problem-solving games with students. However, not all schools fully utilized such collaborations. "We would like more help from community volunteers, but we have difficulty organizing it," said one teacher, indicating room for improvement.

**Table 4.** Average Process Evaluation Score for the Implementation of the Literacy and Numeracy Strengthening Program

No	Indicators	Average	Decision
1.	Learning implementation	3,50	Appropriate
2.	Collaboration and innovation	3,38	Moderately Appropriate
3.	Monitoring and evaluation	3,63	Appropriate

Monitoring and evaluation processes have been implemented in most schools. Schools implement regular monitoring through formative and summative assessments (such as quizzes, exams, and project evaluations) to track student progress. 70% of teachers stated that they administer reading and math quizzes once a month to measure student learning. Many teachers also use learning reflection journals or self-assessment tools for students. In one class, students reflect on their reading progress by coloring in progress charts after completing book reading activities. The teaching team meets regularly to review student learning outcomes and adjust instruction. "After each unit test, we discuss the results and plan follow-up activities in our monthly team meeting," explained a Grade 3 teacher. Some schools implement school-wide literacy or numeracy checklists (e.g., simple screening tests) to identify ongoing needs. The district's mid-year review compiles the results of standardized literacy screenings given to all students, which indicate overall improvement. However, the use of nationally standardized assessment data (such as AKM scores) is inconsistent across schools. "We have AKM scores, but few teachers refer to them when planning lessons," said one principal.

#### **Product Evaluation of the Literacy and Numeracy Strengthening Program**

The product evaluation phase demonstrated improvements in student competency after participating in literacy and numeracy strengthening activities based on the program's end-of-year assessment. Seventy-five percent of teachers reported measurable improvements in students' reading or math skills throughout the year. Many teachers noted improvements in reading fluency and numeracy among their students. Evaluators noted that Grade 3 students who previously struggled with addition were now confidently solving more complex addition problems during classroom observations. Standardized test results generally showed positive trends, although some learning gaps remained. "Students are now reading one or two levels above their starting level, which is a huge improvement," reported one teacher. End-of-year assessment data showed an average increase of 10% in literacy test scores and 8% in numeracy scores across the school. Changes in school culture were also observed. Literacy activities, such as daily reading hours, storytelling sessions, and book fairs, became more common, and numeracy events such as math competitions and puzzle days were introduced.

**Table 5.** Average Product Evaluation Score for the Implementation of the Literacy and Numeracy Strengthening Program

No.	Indicators	Average	Decision
1.	Improvement in student competencies	3,38	Appropriate
2.	Changes in school culture	3,63	Moderately Appropriate
3.	Publications/results	3,50	Appropriate

Survey results indicated that 88% of teachers agreed that the school culture was more supportive of reading and math than in previous years. Classrooms and hallways showcased student work in literacy and numeracy. During a school visit, Evaluators observed a hallway bulletin board celebrating the "Student of the Week" for reading achievement, alongside a math puzzle wall with interactive problems. The entire school community demonstrated increased enthusiasm: many parents and committee members actively supported the Literacy & Numeracy initiative. "We now have a weekly 'reading hour' where the whole school stops and reads together," the principal said. School newsletters and parent-teacher meeting minutes frequently mentioned the

popularity of the new literacy and numeracy reinforcement program, reflecting this cultural shift.

The program produced several tangible results. Student projects, such as storybooks and math posters, were displayed and publicized in school media. 65% of teachers reported sharing at least one lesson plan or sample of student work with colleagues or online. A display case in the lobby of one school displayed a collection of student-written short stories and an award-winning math poster from a class project. Several teachers shared curriculum materials through teacher networks and social media. "*I submitted our reading comprehension lesson plans to a national education website,*" reported one teacher, indicating broader dissemination of best practices. Program results were also presented externally: schools presented at regional education fairs and competitions. The district's annual report noted that one school received recognition at a regional conference for its innovative reading program, demonstrating the program's impact.

### Discussion

The context evaluation results indicate that the implementation of the literacy and numeracy strengthening program in elementary schools has generally aligned with the needs of the educational unit, the student environment, and the results of initial literacy and numeracy assessments. These findings reinforce previous research emphasizing the importance of needs-based programs and diagnostic assessments in improving the effectiveness of literacy learning in elementary schools (Oo et al., 2023).

Furthermore, the successful adaptation of the program to students' socioeconomic characteristics, particularly in schools serving a large number of students from lower-middle-income families, emerged as a key factor, supported by research highlighting the importance of educational policy responses to student diversity (Ghosh, 2025; Kim & Kwon 2025). School policy support, whether in the form of internal regulations such as the School Literacy Movement (GLS), the integration of the Independent Curriculum, or the formation of a literacy and numeracy task force, has encouraged more targeted and sustainable program implementation. Studies show that the existence of clear policies and strong school leadership are crucial in creating a conducive environment for strengthening a culture of literacy and numeracy. Policies that encourage innovation, collaboration, and resource allocation are key catalysts in building a robust literacy and numeracy ecosystem.

The involvement of principals, teachers, school committees, and parents in the planning and implementation of literacy and numeracy programs is also a key strength at the elementary school level. This finding aligns with studies showing that the active participation of school stakeholders significantly contributes to the success of locally responsive, needs-based programs (Alawi 2024; Stover et al., 2024). Synergy between schools and families, including parental involvement in literacy and numeracy activities, strengthens school culture and promotes better student learning outcomes (McWayne et al., 2022). Overall, this contextual evaluation confirms that the implementation of literacy and numeracy strengthening programs in elementary schools is on track, supported by students' actual needs, adequate school policies, and the active involvement of all stakeholders. These findings are consistent with national and international recommendations that promote needs-based learning, multi-stakeholder collaboration, and transformative leadership as the main foundations for strengthening literacy and numeracy in schools.

Evaluation of input aspects shows that elementary schools in the study area have demonstrated a strong commitment to providing human resources, facilities and infrastructure, and financial support for improving literacy and numeracy. Continuous training and mentoring for principals, teachers, and education staff have been key to improving pedagogical competence and teacher professionalism (Faizuddin et al., 2022). This finding supports research suggesting that investment in teacher training has a significant impact on learning innovation and student literacy achievement (Akimov et al., 2023; Sari et al., 2024). From a facilities and infrastructure perspective, a school environment rich in print media, the availability of reading corners, leveled books, and numeracy teaching materials have been key focuses in building a literacy learning ecosystem (OECD, 2023). Innovations such as classroom reading corners and mini-libraries, developed through collaboration between teachers, students, and parents, have proven effective in increasing student interest in reading and engagement. Financial support from the school operational fund (BOS), both regular and performance-based, has been allocated specifically to support literacy and numeracy activities, although there are still challenges in the distribution and optimization of resources in some schools.

From a process perspective, research findings indicate that the integration of literacy and numeracy into intracurricular, cocurricular, and extracurricular learning activities has been actively and variedly implemented. Project-based learning, team learning, and contextual learning are key approaches to developing 21st-century literacy and numeracy skills. Collaboration among teachers, school community involvement, and partnerships with external parties such as libraries and local businesses further strengthen the program's innovation and sustainability. Program monitoring and evaluation are conducted periodically through formative and summative assessments, self-assessment surveys, and collective learning reflections involving the entire school community. These monitoring results are used not only as benchmarks for program achievement but also as a basis for decision-making regarding remediation, enrichment, and the development of further learning strategies. The principle of continuous improvement has become a culture in most schools, indicating that process evaluation practices align with international recommendations for strengthening literacy and numeracy at the primary education level.

Product evaluations indicate that the implementation of literacy and numeracy strengthening programs in elementary schools has significantly impacted student competency, school culture change, and student and teacher productivity. These findings are consistent with research suggesting that systematically designed literacy programs can improve literacy and numeracy assessment results, as reported by Xu et al. (2023) in their cross-country study of basic literacy at the elementary school level. Furthermore, transforming school culture toward improved literacy and numeracy has been shown to positively impact motivation, collaboration, and engagement across the school community in learning activities. Routine activities such as reading habits, student work exhibitions, and student-teacher product publications are key drivers in building an inclusive school ecosystem that supports literacy and numeracy. Research by Barber et al. (2022) also confirms that a strong literacy culture can boost student confidence and expand learning opportunities. The implementation of project-based learning models and school community engagement have proven effective in developing 21st-century skills, as discussed by Sari et al. (2021) and Zhao et al. (2022) in their analysis of active and participatory learning.

Furthermore, the publication of student and teacher work not only boosts confidence and creativity but also serves as tangible evidence of the success of literacy and numeracy programs. The involvement of parents and the wider community in supporting literacy and numeracy activities in schools has been shown to strengthen the sustainability of the program and increase its positive impact on student learning outcomes. Thus, the results of this evaluation not only reinforce the findings of various international studies and best practices but also emphasize the importance of multi-stakeholder collaboration, learning innovation, and ongoing monitoring systems in advancing literacy and numeracy as the main foundation of 21st-century education.

## CONCLUSION

An evaluation of the literacy and numeracy strengthening program in Tegalrejo sub-district using the CIPP model shows that the nine schools have met the government's expectations in terms of context, input, process, and product. The schools have demonstrated a strong commitment to supporting the program by (1) improving teacher human resources, (2) involving principals, and (3) providing financial support from BOS BOP funds and the surrounding community, although parental support is still needed. The process evaluation shows the implementation of varied, active, and collaborative learning models, consistent monitoring, and continuous innovation, which contribute to the sustainability and continuous improvement of the program. The product evaluation shows that the program has resulted in significant improvements in student literacy and numeracy competencies, fostered a strong reading and numeracy culture, and encouraged the publication and exhibition of student and teacher work. Although there are several challenges, such as fluctuating achievement scores and limited resources in some schools. These findings underscore the importance of (1) needs-based planning, (2) continuous professional development, (3) collaboration of all stakeholders, and (4) regular program evaluation in strengthening basic literacy and numeracy as the foundation of 21st-century education.

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