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# Harnessing Collective Intelligence: Innovative Knowledge Management Strategies in Educational Consortia

Akhmetov Adilet Askarovich<sup>1</sup>, Kosherbayeva Aigerim<sup>2</sup>, Begimbetova Guldana<sup>3</sup>

## Abstract

*Education consortiums have emerged as an important mechanism to drive innovation and knowledge sharing in the ever-evolving education landscape. This study aims to analyze effective knowledge management strategies in educational consortiums and identify ways to utilize collective intelligence to improve learning outcomes. Using a descriptive quantitative approach, the study involved 136 respondents consisting of 75 students, 40 teachers, and 21 parents through a structured questionnaire that covered seven dimensions of knowledge management. The results revealed that 47.4% of students and 56.6% of teachers reported the presence of a knowledge management coordinator, with the main focus on monitoring and assessment (34.1%) and the implementation of training (27.8%). Program implementation is still dominated by state education standards (91.3% of teachers, 83.6% of students), while consortium programs and school writer programs are still limited (1.8%). Innovative practices identified include the development of integrated digital platforms, cross-institution mentoring systems, and collaborative school-university programs. In conclusion, although education consortiums show potential in harnessing collective intelligence, more systematic efforts are needed to develop effective and sustainable collaboration mechanisms, including strengthening digital infrastructure and developing contextual learning content.*

**Keywords:** Collective Intelligence, Knowledge Management, Educational Consortium, Learning Collaboration, Educational Innovation, Learning Strategies, Knowledge Sharing.

## Introduction

In recent years, the landscape of education has undergone significant transformations, driven by advancements in technology and the increasing need for collaborative learning environments. Educational consortia, which are alliances of institutions working together to enhance educational outcomes, have emerged as a vital mechanism for fostering innovation and knowledge sharing. These consortia not only facilitate resource sharing but also promote collective intelligence, enabling institutions to address common challenges and leverage diverse expertise (Kashkhynbay et al., 2024). As educational institutions strive to adapt to the rapidly changing demands of the 21st century, understanding the dynamics of knowledge management within these consortia becomes crucial. The concept of knowledge management encompasses the processes through which organizations create, share, and utilize knowledge to achieve their objectives. In the context of educational consortia, effective knowledge management practices can lead to improved decision-making, enhanced teaching methodologies, and better student outcomes (Lipovka et al., 2021). Recent studies have highlighted the importance of collaborative knowledge management strategies in fostering a culture of continuous learning and innovation

<sup>1</sup> Kazakh National Pedagogical University Abay, Email: [achehov69@mail.ru](mailto:achehov69@mail.ru)

<sup>2</sup> Kazakh National Pedagogical University Abay, Email: [aigera63@mail.ru](mailto:aigera63@mail.ru)

<sup>3</sup> State of Yogyakarta University, Email: [begimbetovaguldana227@gmail.com](mailto:begimbetovaguldana227@gmail.com), (Corresponding Author)



among member institutions (Jonbekova et al., 2023). By examining the mechanisms through which knowledge is shared and utilized, researchers can identify best practices that contribute to the success of educational consortia.

Knowledge management strategies in Kazakhstan focus on enhancing innovation and collaboration, particularly in higher education and governance as stated by (Kemaladinovna et al., 2023). Key approaches include integrating project-based learning, fostering knowledge sharing through programs like the Knowledge and Experience Exchange Program (KEEP), and addressing challenges in the knowledge-based economy to improve overall effectiveness and adaptability. These strategies aim to create a robust framework for knowledge dissemination and utilization, ensuring that both academic institutions and governmental bodies can leverage collective intelligence (Kuhlmann et al., 2024). By promoting partnerships between universities, research institutions, and industries, Kazakhstan seeks to cultivate an environment conducive to innovation, ultimately driving economic growth and societal development.

Furthermore, the government has recognized the importance of a knowledge-based economy and is actively working to implement policies that support research and development. This includes investing in technology infrastructure, enhancing digital literacy, and encouraging public-private partnerships. Such initiatives are designed to create a sustainable ecosystem where knowledge is continuously generated, shared, and applied, thereby positioning Kazakhstan as a competitive player in the global knowledge economy.

Despite the growing body of literature on knowledge management, there remains a gap in understanding how specific strategies can be effectively implemented within educational consortia. Previous research has primarily focused on individual institutions, often overlooking the unique challenges and opportunities presented by collaborative frameworks (Lyubov Nikolaevna et al., 2024). This article aims to bridge this gap by exploring the role of educational consortia in transforming knowledge management practices and enhancing educational outcomes. By analyzing recent case studies and empirical evidence, this research seeks to provide actionable insights for practitioners and policymakers (Jorgji et al., 2024).

In addition to the practical implications, this research also contributes to the theoretical understanding of knowledge management within collaborative educational frameworks (Исаева, 2017). By situating the findings within existing literature, this article aims to advance the discourse on the intersection of knowledge management and educational consortia. The insights gained from this study will not only inform future research but also provide a foundation for developing effective strategies that enhance collaboration and learning outcomes.

To achieve these objectives, this article will address two key research questions:

- (1) What are the most effective knowledge management strategies employed by educational consortia to enhance collaboration and learning outcomes?
- (2) How do educational consortia adapt their knowledge management practices in response to emerging challenges, such as those posed by the COVID-19 pandemic?

## **Literature Review**

### **Knowledge Management in Educational Consortia**

Recent studies have underscored the significance of knowledge management (KM) in educational consortia, which are collaborative networks of institutions aimed at enhancing

educational outcomes. Knowledge management encompasses processes that facilitate the creation, sharing, and utilization of knowledge among members (Seitbatkalova et al., 2023). The literature indicates that effective KM strategies can lead to improved decision-making and innovative teaching methodologies, ultimately benefiting student learning experiences (KPMG, 2000). The integration of technology in KM practices has been a focal point in recent research. Studies have shown that digital platforms enable seamless communication and resource sharing among educational institutions, fostering a culture of collaboration (Jorgji et al., 2024). For instance, cloud-based tools and collaborative software have been identified as essential for facilitating real-time knowledge exchange, which is crucial for the success of educational consortia (Suhardiman et al., 2024).

### **The author's knowledge management program for students is based on the model of the educational consortium "School-University"**

Creating a knowledge management program for the "School-University" educational consortium requires an integrated approach and integration of various methods, tools and resources. The program should contribute to the effective transfer of knowledge, cooperation between the consortium members and the improvement of educational practices of the "School-University" educational consortium. Interaction between representatives of higher educational institutions and secondary educational institutions in the implementation of joint projects and programs has the potential to improve both the quality of education and the effectiveness of the educational system as a whole. This can manifest itself in the following aspects:

#### **1. Improving the quality of education:**

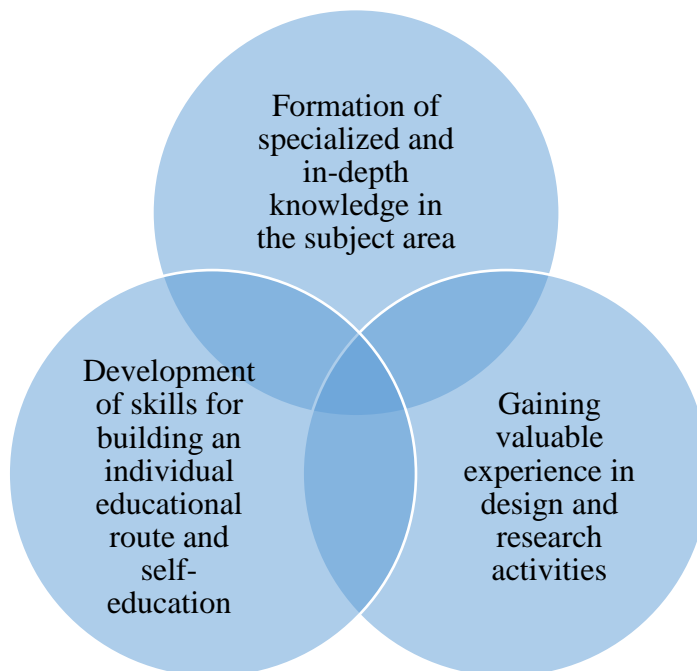


Figure 1, Illustrates– Improving the Quality of Education

In the context of improving the quality of education, the formation of in-depth and specialized knowledge in a particular subject area is the main foundation for achieving academic excellence. This aspect allows students to have a comprehensive and in-depth understanding of the field of study they are engaged in. Valuable experience in design and research activities is a crucial component in a quality learning process. Through hands-on involvement in research and design projects, learners can develop analytical, critical, and creative abilities that are essential for academic success. The development of skills in building individual educational routes represents a student-centered learning paradigm. This allows them to take control of their own learning process and optimize their academic potential according to individual interests and abilities (Mukayev et al., 2023).

The integration of these three elements creates a holistic and effective learning ecosystem. This system not only facilitates high academic achievement, but also prepares students to become competent independent learners in facing future educational challenges.

## 2. Improving the quality of the educational system:

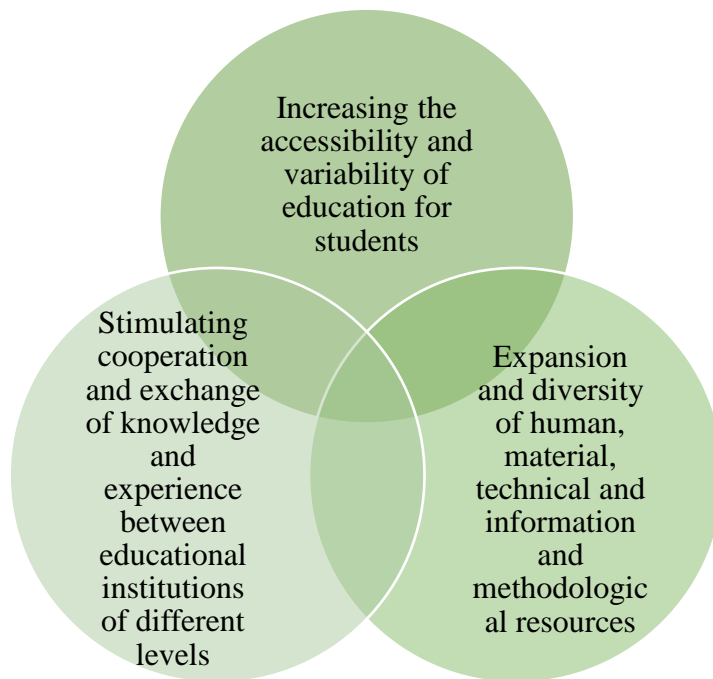


Figure 2 – Improving The Quality of the Educational System

As we know that, Increasing the accessibility and variability of education for students is a fundamental aspect in improving the education system. This includes the provision of various learning paths and methods that can accommodate the diversity of students' learning needs and preferences. The expansion and diversification of human, material, technical, as well as information and methodological resources is the catalyst in the transformation of the education system (Mukhatayev et al., 2024). The availability of diverse and quality resources allows educational institutions to implement more comprehensive and innovative learning programs.

Stimulation of cooperation and knowledge exchange between educational institutions at various levels creates productive synergies in the education ecosystem. This collaboration facilitates knowledge transfer, sharing best practices, and developing more effective learning methodologies (Manarbek & Kondybayeva, 2024).

The systematic and coordinated implementation of these three components results in an overall improvement in the quality of the education system. This creates a dynamic, adaptive, and responsive learning environment to the development of contemporary educational needs.

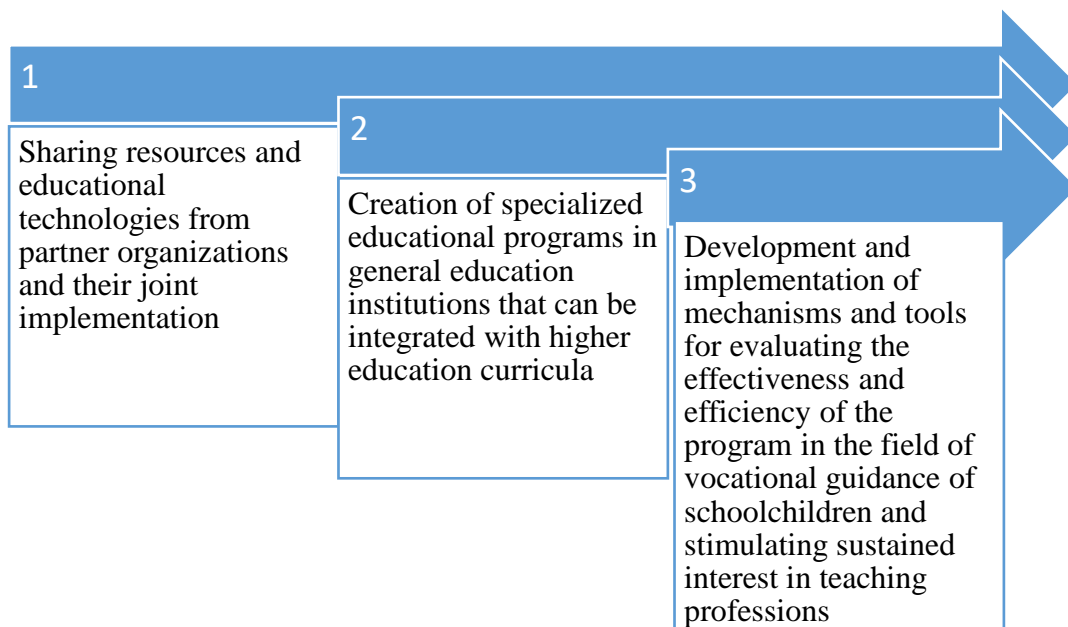


Figure 3 – Tasks of the Author's Program "Network Career-Oriented Innovative Project"

Based on figure 3, this program presents an innovative approach in sharing educational resources and technology between partner organizations (Utegenova et al., 2024). This collaboration allows for optimal use of learning resources and creates beneficial synergies for all stakeholders in the education ecosystem. The creation of special education programs in general education institutions that can be integrated with the higher education curriculum represents an effort to harmonize educational paths. This integration facilitates a smoother transition for learners from secondary to higher education (Kireyeva et al., 2024). The development and implementation of mechanisms and instruments for evaluating the effectiveness of programs in the field of vocational guidance are vital components. This allows for systematic monitoring and assessment of the program's success in fostering a sustained interest in the teaching profession (Kemelbekova et al., 2024).

The overall program reflects a comprehensive approach to developing a career-oriented and innovation-oriented education system. Through the integration of various program components,

an educational ecosystem is created that supports the professional and academic development of students optimally

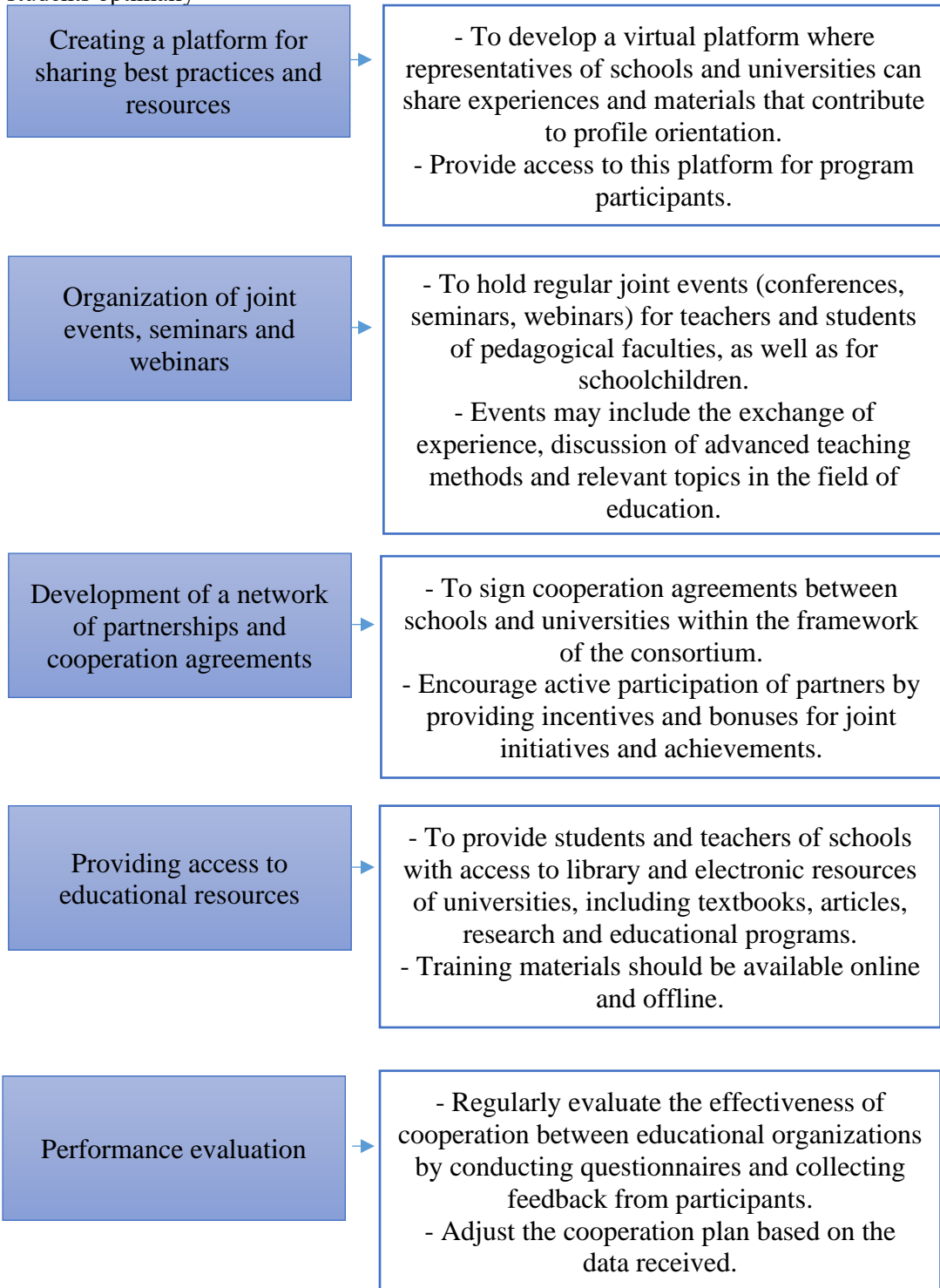


Figure 4 Sharing Resources and Educational Technologies

The primary goal of this framework is to establish a comprehensive educational ecosystem that bridges the gap between schools and universities while fostering collaborative learning and resource sharing (Sergey et al., 2024). This system aims to create a seamless integration between different levels of education, ultimately enhancing the quality of education and professional development for all participants. The first component focuses on creating a virtual platform for sharing best practices and resources. This platform serves as a central hub where school representatives and university faculty can exchange their experiences, teaching materials, and methodologies related to profile orientation. By providing universal access to program participants, this platform ensures that valuable educational resources and innovative teaching approaches are readily available to all stakeholders (Helmer et al., 2024).

However, The second element emphasizes the organization of joint events, seminars, and webinars. These regular collaborative gatherings bring together teachers, students from pedagogical faculties, and schoolchildren in a dynamic learning environment. These events serve as forums for exchanging experiences, discussing cutting-edge teaching methods, and exploring contemporary educational topics, thereby fostering a culture of continuous professional development and innovation (Imanova et al., 2025). The third aspect involves developing a network of partnerships and cooperation agreements. This is achieved through formal cooperation agreements between schools and universities within the consortium framework. To ensure active participation and sustained engagement, the system incorporates incentives and bonuses for joint initiatives and achievements, motivating institutions to maintain and strengthen their collaborative efforts (Jonbekova et al., 2023).

On the other hand, The fourth component addresses the provision of access to educational resources. This crucial element ensures that students and teachers at schools can access university libraries and electronic resources, including textbooks, articles, research papers, and educational programs (Kashkhynbay et al., 2024). The availability of these materials in both online and offline formats ensures maximum accessibility and flexibility for all users. The fifth element focuses on performance evaluation, implementing a systematic approach to assessing the effectiveness of cooperation between educational organizations (Wiig et al., 1997). This is accomplished through regular questionnaires and feedback collection from participants, ensuring that the program remains responsive to user needs and continues to meet its objectives effectively. The framework concludes with a dynamic adjustment mechanism, where the cooperation plan is regularly modified based on collected data and feedback. This adaptive approach ensures that the program remains relevant, effective, and aligned with the evolving needs of educational institutions and their stakeholders, ultimately creating a sustainable and continuously improving educational ecosystem.

### **Collective Intelligence and Decision-Making**

As we can see today, Collective intelligence, defined as the shared or group intelligence that emerges from collaboration, has been highlighted as a critical factor in enhancing decision-making processes within educational consortia. Research indicates that leveraging collective intelligence leads to more informed and effective decisions, as diverse perspectives contribute to problem-solving (Nurtayeva et al., 2024). This aspect of KM is particularly relevant in the context of educational consortia, where collaboration among various stakeholders is essential for achieving common goals. The COVID-19 pandemic has posed unprecedented challenges to educational institutions, necessitating a reevaluation of existing KM strategies. Recent literature

reveals that educational consortia have adapted their KM practices to address the shift to remote learning and digital transformation (Hakiki et al., 2023). This adaptation has involved the rapid implementation of online platforms for knowledge sharing and collaboration, demonstrating the resilience and flexibility of consortia in the face of adversity.

Despite the growing body of research on KM in educational consortia, significant gaps remain. Much of the existing literature has focused on individual institutions rather than the collaborative dynamics inherent in consortia (Tleuov, 2024). Additionally, there is a lack of empirical studies that explore the long-term impacts of KM strategies on educational outcomes, particularly in the context of rapidly changing technological landscapes (Kopzhassarova & Izotova, 2024).

However, Theoretical frameworks play a crucial role in understanding KM practices within educational consortia. Recent studies have employed various theoretical lenses, such as social constructivism and systems theory, to analyze how knowledge is generated and shared in collaborative environments as conducted by (Sarzhanova et al., 2024). These frameworks provide valuable insights into the mechanisms that underpin effective KM and highlight the importance of context in shaping KM practices. Future research should focus on longitudinal studies that assess the effectiveness of KM strategies over time, particularly in relation to student outcomes (Kireyeva et al., 2024). Additionally, exploring the role of emerging technologies, such as artificial intelligence and machine learning, in enhancing KM practices within educational consortia could yield significant insights (Antoniou et al., 2024). Investigating the impact of cultural and institutional factors on KM implementation will also be essential for developing tailored strategies that address the unique needs of different consortia (Wiig et al., 1997).

## **Research Methodology**

### **Research Design**

This study uses a descriptive quantitative approach with a survey method to analyze the implementation of knowledge management in the context of an educational consortium as conducted in the research by (Sarzhanova et al., 2024). This approach was chosen to obtain a comprehensive overview of knowledge management practices applied in educational settings.

### **Participant**

The study involved a total of 136 respondents representing various stakeholders in the education system, consisting of 75 students in grades 10-11, 40 teachers, and 21 parents. The selection of these diverse respondents aims to obtain balanced perspectives from various perspectives in the education ecosystem. The research location is at Almaty Specialized Lyceum 165.

### **Instrument Analysis**

The main instrument used in the study was a questionnaire that was systematically designed to include 13 questions. These questions were developed to explore information in seven main dimensions of knowledge management: (1) organizational structure and knowledge management, (2) training programs and methods, (3) information infrastructure, (4) learning and interaction processes, (5) evaluation of knowledge management systems, (6) resources and support, and (7) strategic direction and development.

### **Data Collections**

The data collection process is carried out in stages and in a structured manner. The first stage began with the distribution of questionnaires to students in grades 10-11, followed by



distribution to teachers, and finally data collection from parents. After all the data is collected, a documentation process and verification of the results of the questionnaire are carried out to ensure the completeness and accuracy of the data obtained.

## Data Analysis

Data analysis uses comprehensive descriptive statistical techniques to identify various important aspects in the implementation of knowledge management. The analysis includes the calculation of the frequency distribution and percentage of each component, the identification of patterns and trends in the implementation of knowledge management, the comparison of perceptions between groups of respondents, and the identification of areas that require further development. This analytical approach allows researchers to gain an in-depth understanding of ongoing knowledge management practices as well as identify opportunities for future improvement and development.

## Research Results

### 1. Initial State Diagnosis of the Knowledge Management Process

Preliminary analysis of the state of knowledge management in schools shows variations in organizational structure and division of responsibilities. The following is a comparison of perceptions between students and teachers regarding the structure of knowledge management:

<b>Table 1 Comparison of student and teacher perceptions related to knowledge management structure</b>	<b>Student (%)</b>	<b>Teacher(%)</b>	<b>Gap (%)</b>
<b>Structure Aspect</b>			
<b>Knowledge Management Coordinator</b>	47.4	56.6	9.2
<b>No formal structure</b>	34.2	21.7	12.5
<b>Other Structures</b>	18.4	21.7	3.3

The data in Table 1 shows that there is a significant difference in perception between students and teachers regarding the knowledge management structure. The biggest gap was seen in the perception of the absence of formal structure, where students tended to report more structural absence than teachers.

Furthermore, an analysis of roles and responsibilities in knowledge management shows the following distribution:

<b>Table 2 of perceptions of students and teachers regarding roles and responsibilities in knowledge management</b>	<b>Student (%)</b>	<b>teacher(%)</b>	<b>Total (%)</b>
<b>Role and responsibilities</b>			
<b>Monitoring and Assessment</b>	39.1	29.1	34.1
<b>Training</b>	30.5	25.0	27.8
<b>Curriculum Development</b>	15.2	20.8	18.0
<b>Other Activities</b>	15.2	25.1	20.1

Table 2 indicates that monitoring and assessment are the main focus in knowledge management, followed by the implementation of training. Interestingly, there is a significant difference between the perception of students and teachers in terms of curriculum development.

### Knowledge Management Program Implementation

The implementation of knowledge management programs is reflected in the use of curriculum and teaching methods. The following is the distribution of curriculum use in schools:

Types of Curriculum	Teacher(%)	Student (%)
<b>State Education Standards</b>	91.3	83.6
<b>Consortium Programs</b>	0.0	1.8
<b>School Writer Program</b>	0.0	1.8
<b>Other Programs</b>	8.7	12.8

Table 3 Distribution of Curriculum Use

The data in Table 3 shows the dominance of state education standards in curriculum implementation, while the consortium program and the school writer program are still very limited in use.

### Model and Program Effectiveness

The effectiveness of the program is assessed through various evaluation and measurement methods. The following is a distribution of the evaluation methods used:

Evaluation Methods	Usage Percentage (%)	Effectiveness Level
<b>Formal Exams and Assessments</b>	40.0	High
<b>Portfolio and Project</b>	30.0	Medium
<b>Surveys and Feedback</b>	20.0	Medium
<b>Academic Performance Analysis</b>	10.0	High

Table 4 Distribution of Evaluation Methods

Table 4 shows that formal evaluation methods still dominate, although alternative methods such as portfolios and surveys are also beginning to be implemented. The level of effectiveness varies depending on the context and purpose of the evaluation. Based on the overall results of the research, it can be concluded that knowledge management in schools is still in the development stage. Although the basic structure already exists, it still needs to be strengthened in various aspects, especially in terms of diversifying teaching methods, utilizing technology, and strengthening collaboration between stakeholders.

These findings also underscore the importance of developing programs that are more integrated and adaptive to contemporary learning needs, as well as the importance of strengthening teacher capacity in the implementation of various innovative learning methods.

### Aspects of Collective Intelligence in the Education Consortium

The research revealed several important findings related to the use of collective intelligence in educational consortiums. First, there is a pattern of collaboration between institutions shown through knowledge exchange programs between schools and universities. Second, a mechanism for sharing best practices between schools in a consortium was found that facilitated collective

learning. Third, there is a shared knowledge repository system that can be accessed by all members of the consortium.

### **Innovative Practices in Knowledge Management**

Some of the innovations identified in the study include: the development of an integrated digital platform for knowledge sharing, the implementation of a cross-institution mentoring system, and the development of collaborative programs between schools and universities. These programs demonstrate the consortium's efforts in developing new approaches to knowledge management.

### **Discussion**

The results of the study show that the implementation of knowledge management in the education consortium has several interesting characteristics that need to be studied more deeply. Regarding the organizational structure, the majority of schools already have a knowledge management coordinator who plays a role in organizing and managing the knowledge sharing process. However, there is still a significant gap in terms of the existence of formal structures, where some schools do not have a clear structure for knowledge management. In terms of roles and responsibilities, the main focus still lies on monitoring and assessing student knowledge, as well as the implementation of training. This indicates that knowledge management approaches still tend to be traditional and have not fully adopted the modern collaborative learning paradigm. Curriculum development that received a smaller portion shows a lack of innovation in the development of learning content.

The implementation of knowledge management programs is still highly dependent on state education standards, with the lack of use of education consortium programs and school writer programs. This condition describes a lack of flexibility and adaptability in the development of a curriculum that suits the specific needs of students and the local context. The teaching methods applied show a combination of traditional and modern approaches, although conventional lectures still dominate. Regarding the effectiveness of the program, the evaluation system implemented still relies on formal assessment methods, although it has begun to integrate alternative approaches such as portfolios and projects. This shows that there are efforts to develop a more comprehensive assessment, but it still needs to be strengthened in its implementation.

The aspect of collective intelligence in the education consortium shows great potential but has not been utilized optimally. The innovative practices found in the study indicate that there is an effort to transform from traditional knowledge management models to more collaborative and adaptive systems. The implementation of the author's program in the context of a school-university consortium shows the importance of integration between academic practice and field experience.

### **Conclusion**

This research reveals that knowledge management in the education consortium is still in the transition stage towards a more modern and adaptive system. Although there has been awareness of the importance of systematic knowledge management, its implementation still faces various challenges, especially in terms of developing innovative curricula and applying more collaborative learning methods. This research successfully identified the potential for collective intelligence in educational consortiums that can be optimized through innovative knowledge management strategies. The school-university consortium model has proven to be an effective

forum for developing and sharing innovative practices in education. However, more systematic efforts are needed to develop more effective and sustainable collaboration mechanisms.

Thus, The implications of this study lead to the need to strengthen institutional capacity in developing a more integrated knowledge management program. In the future, education consortiums need to pay more attention to program development that encourages active collaboration between stakeholders, more optimal use of learning technology, and sustainable professional development for educators. The foresight hints at the importance of transforming knowledge management that is more adaptive to changing times. Education consortiums need to develop more comprehensive strategies in managing knowledge, including strengthening digital infrastructure, developing more contextual learning content, and creating a more collaborative learning environment.

Overall, This research has several limitations that need to be considered. First, the focus of research that is limited to structural and operational aspects has not fully revealed socio-cultural dynamics in the implementation of knowledge management. Second, the use of quantitative survey methods limits the in-depth understanding of the subjective experiences of stakeholders. Third, limited geographical scope affects the generalization of research findings. For further research, it is recommended to use a mixed-method approach that can provide a more comprehensive understanding of the implementation of knowledge management in the context of education.

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The author declares no conflict of interest related to this research and its publication.

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