Knowledge hub
-
Collection of best practices

Summary of the best practice

1. Title of the best practice (e.g. name of policy, programme, project, etc.) *

AI-driven Primary School Students' Emotional Education Support System

2. Country or countries where the practice is implemented *

Shanghai, China

3. Please select the **most relevant** Action Track(s) the best practice applies to *

- [ ] Action Track 1. Inclusive, equitable, safe, and healthy schools
- [ ] Action Track 2. Learning and skills for life, work, and sustainable development
- [ ] Action Track 3. Teachers, teaching and the teaching profession
- [x] Action Track 4. Digital learning and transformation
- [ ] Action Track 5. Financing of education

4. Implementation lead/partner organization(s) *

Shanghai Municipal Education Commission

5. Key words (5-15 words): Please add key descriptive words around aims, modalities, target groups etc. *

AI-driven, primary school, emotional education, big data, support system

6. What makes it a best practice? *

Luwan No. 1 Central Primary School takes emotional education as its school feature. It has been educating students through teaching, activities and communication for a long time to carry out the practice of cultivating students' healthy emotions and building a complete education. In the era of intelligence, it places more emphasis on emotional education related to human nature, and has AI technology be the new tool for emotional education. Through the application practice of artificial intelligence technology, this pratice explores how to use the power of technology to better identify the emotional state of students and teachers, to perceive emotional changes, to evaluate the effects of emotional education, and to promote the development of emotional education in schools. The practice uses artificial intelligence, big data and other emerging information technologies to reconstruct the education and teaching process, with the core goal of educating people, combined with the school's emotional teaching philosophy, through the accumulation of collected emotional change information, enriching the school's multi-dimensional integration data, improving students’ digital portraits to help schools better teach students according to their aptitudes. Through human-machine collaboration, we can make better use of the common wisdom of teachers and AI systems, continuously improve the knowledge capabilities of AI systems, and help schools improve emotional education through application forms like output visualization, quantifiable emotional education effect analysis reports and intelligent early warning reminders.

Description of the best practice

7. Introduction (350-400 words)
   This section should ideally provide the context of, and justification for, the practice and address the following issues:
   i) Which population was affected?
   ii) What was the problem that needed to be addressed?
   iii) Which approach was taken and what objectives were achieved? *

This practice aims to build the following systems:
1. Education Big Data System: The campus data center is constructed to realize multi-dimensional data source collection, data fusion and aggregation, mining and analysis in teaching, learning, campus management and other aspects, to support the precipitation of emotional education label data and the development of comprehensive quality evaluation.
2. Educational Data Visualization System: Through the ability of campus modeling and spatial data release, the digital campus can be displayed on a large screen. Combined with the characteristics and development planning of the school, the data visualization of students, teachers, schools and other analysis topics can be realized.
3. Emotional Education Assistance Application System: Introduce various methods such as intelligent voice emotion monitoring, video recognition, and physiological psychological data collection. Based on the support of educational big data, the analysis model of emotional education is constructed. Through information technology, the sensory reminder and effect monitoring ability of school emotional education will be further improved.
The school builds an emotional education support system driven by AI, explores large-scale students in accordance with their aptitude, advocates reduction of burdens and efficiency, and provides appropriate education for each student. The school uses the system to focus on students, teachers, education and teaching processes, and gradually move toward smart applications based on data.
The school provides intelligent accessibility for both the teacher and the student, including teachers' teaching assistance and student health care. On one hand, the school provides intelligent data assistance to the teachers and it can objectively let teachers understand students' learning effects through classroom teaching analysis reports. Teachers use data for teaching research and teaching quality improvement. On the other hand, the school provides intelligent tools to assist in reviewing certain time through intelligent classroom teaching and recording functions. The classroom teaching video, combined with teaching analysis data for teaching reflection, targeted adjustment of teaching plans and teaching methods. Through the intelligent teaching board extraction function, the system can conveniently retain the teaching board for teaching research and assist students to review. Through the intelligent teaching video editing function, it can save the key knowledge points taught in the class in video mode to help students to consolidate their knowledge points. For students, the system provides a comprehensive observation of the health status of students in the classroom learning process through poor sitting posture and visual and fatigue warning functions, helping teachers and parents to find problems in time and take appropriate measures to help students develop good learning habits and grow up healthily.

8. Implementation (350-450 words)
Please describe the implementation modalities or processes, where possible in relation to:
i) What are the main activities carried out?
ii) When and where the activities were carried out (including the start date and whether it is ongoing)?
iii) Who were the key implementation actors and collaborators? (civil society organizations, private sector, foundations, coalitions, networks etc.)?
iv) What were the resources needed (budget and sources) for the implementation? *

Firstly, provide the student group's emotional perception function, and provides multi-dimensional emotional data for the school. Secondly, establish a student's learning portrait with which the teacher can deeply understand the interest and concentration of each student in each subject. It provides personalized guidance and advice to the students in a targeted manner, enriching the emotional education dimensions. Finally, establish a teacher's teaching portrait of which the teacher's teaching attitude, teaching mode and teaching intention are analyzed to promote the self-improvement of teachers and personal professional development.
1. Comprehensive fine-grained classroom teaching analysis promotes data-driven precision teaching
The deep integration of artificial intelligence technology and classroom teaching scenes helps teachers master classroom teaching data of dozens of dimensions and then apply it to teaching research, which not only helps improve the overall teaching quality, but also helps teachers master students' classroom learning feedback more comprehensively and realize the data-driven accurate teaching and the full coverage of teachers' teaching behavior.
2. Reaching a closed loop of teaching feedback quickly with automatic data collection and analysis mode
By concomitantly collecting multidimensional data such classroom emotions, voices and behaviors, the analysis report of classroom teaching is generated automatically. The comprehensive and detailed teaching analysis report helps teachers understand the characteristics of different students in a more comprehensive way, thereby, teachers have the access to make targeted teaching plans. Teaching managers have a fine-grained understanding of the overall teaching situation of a school so that they discover and solve problems just in time and implement an immediate, efficient and scientific teaching management mechanism.
By using AI and big data technology, combined with PC, PAD, mobile phone, printer, Cloud Watch, Smart Handwriting Board and other smart terminals as support, full scene and full cycle intelligent teaching applications can be provided for the five teaching procedures.
3. The intelligent non-perception system enriches school teaching management forms
To establish a student-centered intelligent sensorless system, to understand the objective learning feedback of every student in the school in an all-round and fine-grained way, to assist teaching managers and teachers to instantly understand the learning and life dynamics in the campus, reduce management risks, and help every student learn and grow better, so as to achieve the goal of basic education and teaching of moral education.

9. Results – outputs and outcomes (250-350 words)
   To the extent possible, please reply to the questions below:
   i) How was the practice identified as transformative? (e.g., impact on policies, impact on management processes, impact on delivery arrangements or education monitoring, impact on teachers, learners and beneficiary communities etc.);
   ii) What were the concrete results achieved with regard to outputs and outcomes?
   iii) Has an assessment of the practice been carried out? If yes, what were the results? *

The results of the practice are as follows:
1. Based on the perceptual data of audio and video, this practice builds a deep learning intent and emotion recognition engine based on multi-modal emotion and emotion recognition technology, intelligently identifies and analyzes the emotional information transmitted by the phonetic intonation and video information in the school scene. This helps teachers to perceive students' emotional state changes, and combine psychology and education to achieve the optimization of school education strategies.
2. The practice forms an intelligent teaching support system. In the course of preparing lessons, teaching, homework, counseling and evaluation, the project constructs the corresponding teaching application system and conducts normalized teaching application. Through all kinds of information terminals, the full scene of teacher operation behavior data and teacher resource usage data is realized. The whole process is accompanied by acquisition. Combined with the teaching behavior data of teachers using various teaching application systems, the project assists teachers to conduct targeted lesson preparation and commentary, to effectively improve teachers' work efficiency, provides decision support for teaching management, and data services for family-and-school education. Through the comparison of new and old teachers and the continuous tracking of the teacher's growth process, it provides targeted guidance for the professional development of teachers.
3. The individual digital portraits of the students are gradually improved. Collected by accumulating the emotional change of information, it helps schools for better quality, auxiliary implementing emotional education to be carried out according to their aptitude. Through human-machine collaboration, the project makes better use of the common wisdom of teachers and AI systems, continuously enhances the knowledge capabilities of AI systems, and helps schools improve their emotional education by outputting visual and quantifiable emotional education effects analysis reports and other application forms.

10. Lessons learnt (300 words)
To the extent possible, please reply to the following questions:
i) What were the key triggers for transformation?
ii) What worked really well – what facilitated this?
iii) What did not work – why did it not work? *

The key factor to bring about the change is "student-oriented", focusing on students' development of core literacy and cultivating students' good emotional ability to adapt to future development.
Emotional ability generally includes empathy ability, emotional recognition ability, emotional regulation and expression ability, experience and understanding ability. Luwan No.1 Central Primary School starts from enlightening students' basic emotional ability. First, students are encouraged to learn to feel emotions and express real emotions. Cultivating the students' emotional ability starts from the emotional self-feeling and real expression. Then, on the basis of learning how to feel emotions, students learn how to feel, recognize others' emotions, experience and understand others' emotions, and learn how to output emotions. Let the students learn how to express their emotions correctly, can control their emotions, accumulate the output of emotion, feel the actual experience of happiness, so as to make the expression of emotion accurate, reasonable and rich, and can choose the right way of expression. The school has set up an emotional education course. From the initially incorporated into the curriculum, emotional education gradually extended to school management, team building, teaching research, and logistics support, which has become the school-running characteristics of Luwan No.1 Central Primary School.
Classroom is the most important place where students spend the most time in school. Students' objective emotional expression in class directly reflects their objective emotional state and psychological state. Therefore, the understanding of students' emotional changes and characteristics in the classroom learning process can be used as an important data aid for emotional education, including emotional proportions in the classroom learning process, positive and negative emotional changes, and typical students with learning pleasure. This is a topic that requires eternal exploration.

11. Conclusions (250 words)
Please describe why may this intervention be considered a “best practice”.
What recommendations can be made for those intending to adopt the documented “best practice” or how can it help people working on the same issue(s)? *

In the traditional classroom, a teacher faces dozens of students in the class; classroom exercises, feedback collection of teaching information, etc., all need to be obtained through relatively extensive way such as “inquiry one by one”; students’ points of interest, difficulties, and the data of the learning process are all hidden in the "black box", and it is difficult for the teacher to adjust the teaching plan. Now "Human-Machine Collaboration" opens up this "black box", making classroom data transparent and making everything different. "Human-Machine Collaboration" gives the real-time feedback of dynamic data. Through the analysis of students' answer data, it generates learning dynamic curves and shows real-time analysis of knowledge points, wrong questions and wrong causes. This provides a scientific basis for teachers' next teaching, and makes teaching more targeted and timed. With the high-tech factors such as big data, combined with the dynamic generation of smart teaching programs in the brains of teachers, we will jointly establish a “Brain of Educational Informatization” to achieve organic collaboration between teachers and artificial intelligence. The learning data generated by “Human-Machine Collaboration” provides teachers with “classroom navigation” to achieve more effective and appropriate learning methods for students.
Big data platform gathers students' basic data, academic data, learning process data, social practice and life data and other big data at all levels. Educators need to take a more holistic view of a child's development and then formulate appropriate learning plans for each child.

12. Further reading
    Please provide a list and URLs of key reference documents for additional information on the “best practice” for those who may be interested in knowing how the results benefited the beneficiary group/s. *

    Link: https://pan.baidu.com/s/1qMYt7mM1tUfBUNdHEvhIDA
    Fetch Code: hgkg