



Information Technology in Education: Applications, Management Practices and Empirical Evidence

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Abstract. Education everywhere is turning digital. IT now drives how schools look and how they run day-to-day. We studied two angles at once: tech inside lessons and data behind the office. First, we mapped real moves for smart classrooms, blended lessons, and sharing gear across districts. We picked two live cases: Yantai High-tech Zone's smart campus platform and one city junior high that lets kids learn at their own speed. We tracked what happened. Classes moved faster, paperwork slimmed, and kids in poorer areas got a fairer shot. At first we thought tech might help a little. The numbers later shouted it juices up teacher-student talk and chops red tape. Another thing worth mentioning, it closes gaps. Near the end we dig into what still blocks schools from plugging tech in. Then we sketch fixes that fit each mess. We hope the story and stats here hand leaders a down-to-earth playbook for pushing educational informatization further up the ladder.

Keywords: information technology in education; educational management informatization; smart campus; personalized learning; data-driven decision-making

1 Introduction

Digital transformation is sweeping the globe. Schools no longer see ICT as a nice extra; they treat weaving it into lessons as an indispensable strategic task. The days of just stacking hardware are long gone. Teaching methods, admin routines, and even the way we grade have all been deeply integrated with technology. Top academic journals and people in the field keep hammering on two big demands. First, they want solid evidence that the tech actually works. Second, they need clear, data-driven guidance for decisions, not fuzzy gut feelings. Earlier work keeps pointing out that information technology can really fix some stubborn headaches in education. It evens out lopsided resource spread, tightens up clunky teaching steps, and chops red-tape in school offices ^{[1][3]}. Still, today's studies carry clear weak spots. These gaps block technology from sinking deep into everyday classrooms:

1. Most papers stop at the talking stage. They spell out what tech "should" do, yet skip the messy how. Principals, teachers, and admins are left without a plain map for slipping gadgets into everyday lessons, homework tasks, or the usual office routines.

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Another thing worth mentioning: no one hands over the tiny, step-by-step moves that would make the tools actually practical.

2. Empirical backup is thin. Most studies stick to short stories or a handful of classrooms. Big-number checks and long-term follow-ups hardly show up. We still lack hard numbers that spell out how tech lifts teaching speed, lifts student scores, or narrows the equity gap.

3. Separation of application and management: Few studies look at both sides at once—how tech is used in class and how schools run on digital tools. Most pick one angle. They skip the back-and-forth between teaching and the admin gear that keeps it moving, so the picture stays half-finished.

We still have blank spots in the literature. This paper keeps "application + management" as its twin centre. It maps out, step by step, how IT slips into everyday campus life: classrooms, shared resources, admin offices. Empirical numbers then show whether these tools really trim red tape and even the odds. In the end we hand over two things: a tight theory and a playbook schools can run with, so educational informatization can push deeper.

This paper chips in a few things. First, it pulls together the key points. Then it lays them out, plain and clear:

- We need to build a full-scale theoretical framework. It should show how information technology fits into everyday teaching and learning. The heart of the idea covers three points: turning materials into digital files, letting software handle routine steps, and giving students several ways to talk back. On the management side, the same framework has to speak about faster admin work, choices that come from live data, and tighter links between home and school. Pulling these parts together will add fresh muscle to the wider educational informatization system.
- Pin down where IT actually shows up in schools. Smart classrooms light up first. They let a teacher toss a question on the big screen and see answers pop up live. Next, kids pick their own next video after a quick quiz; that's personalized learning in action. Another thing worth mentioning: teachers blend a MOOC clip with in-class debate, so the same lesson runs online and offline. Far-away schools then tap a shared drive, grabbing the same lab simulation. Each scene still needs tighter management. Start with a tiny pilot, one class. Track what bogs down—maybe log-ins crawl. Fix that, then roll to the grade. Keep the loop short: watch, tweak, move on. Write the steps on one page so any teacher can copy it, no tech degree needed.
- We ran two deep-dive case studies: Yantai High-tech Zone Smart Campus Management Platform and Beijing Middle School Personalized Learning Practice. They give fresh numbers that back up the idea tech can speed up teaching, cut admin bills, and shrink learning gaps.
- Point out key challenges. Data privacy keeps popping up. Schools also hit a wall called the digital divide. Many teachers still lack solid digital literacy. Kids sometimes misuse generative AI. Lay out matching fixes. These notes give decision-makers something to chew on while they draft policies. The goal is to keep educational informatization moving, not stalling..

2 Theoretical Framework of it Integration in Education

2.1 Core Connotation of IT Application in Education

IT shows up in classrooms in two big ways. First, it speeds things up. A teacher taps a button and a quiz pops up on thirty screens. No one waits for paper to crawl through a copier. Second, it widens the door. A kid on a mountainside can open the same slide deck as a kid downtown. The mountain kid just needs a signal. Speed and reach sound simple. They hide a trickier layer. Tech never walks in alone. It drags habits, budgets, and fears with it. A school buys shiny tablets. Two months later the Wi-Fi coughs. Tablets gather dust. The story repeats everywhere. The gadget is never the whole story. So the real core is not the gadget. It is the quiet deal people make after the gadget lands. Teachers decide the screen is a partner, not a rival. Students decide the chat box can stay open but the meme waits until break. Leaders decide to pay for upkeep, not only the launch splash. When those tiny deals hold, tech turns into education. When they collapse, tech stays a toy. Another thing worth mentioning: the same tool can shrink gaps or widen them. A rich district hands every child a laptop plus a help hotline. A poor district hands the same laptop but no hotline. The first kid learns faster. The second kid feels slower. The machine looked neutral. The support around it was not. In short, the core connotation is human negotiation hidden inside circuits. Circuits carry voltage. People carry expectations. Only when both travel together does the light actually turn on.

IT in classrooms isn't just swapping chalk for screens. It changes how a lesson feels. It also changes how teachers talk and how students pick up new ideas. First, it speeds things up. One click pulls a 3-D heart into biology. Kids twist it on the board and eyes stay open longer. Next, it stretches the walls. A village school can watch a lab demo from Tokyo, live. Distance stops mattering. Another thing worth mentioning: data starts to whisper. Each tap leaves a trace. A teacher sees who's stuck on fractions before the quiz bombs. The tool doesn't grade; it nudges her to act. Finally, the whole thing flips roles. Learners grab devices, build clips, teach back. They take on their own pace, actually practical. The core is simple: tech shows up as a quiet partner, not the star, and lets learning breathe deeper.

Schools are now snatching up modern tech. They pull in cloud, big data, AI, IoT. The goal is to tidy up resources, cook up fresh teaching tricks, and make learning stick better. The whole idea sits on three rungs:

- One key aspect is resource digitization. Teachers take old handouts and turn them into digital files. These files are easy to pass around and pop up again in totally different lessons.
- Another core element is process intelligence. Smart systems sift through how each kid ticks. They then hand over resources that actually fit. At the same moment, the tech pings back whether the lesson is landing or still floating in mid-air.
- The third aspect is interaction diversification. Teachers, students, and parents now hop onto online platforms. These tools knit fresh, many-sided channels, so everyone talks more smoothly and keeps the loop actually complete.

- Generative AI keeps popping up everywhere. It can now act like a personal tutor and whip up tailor-made study bits. That extra trick gives plain old information technology a deeper role in the classroom [2].

To make the idea clearer, we first bring in TPACK theory. It stands for knowledge of technical education content. Take math class. Teachers look at the mistakes an AI makes. They turn those slips into short logic drills. Step by step, kids plug the exact gaps they need. Now shift to Chinese writing. A generative AI can sketch a paragraph frame. It can also suggest smoother phrases. It never hands over a full essay. Same tool, two subjects, two stories. TPACK shows why the hit rate changes. It gives teachers a solid reason to blend tech in a subject-specific way.

The newest work on digital divide theory gives us a lens. This paper slices the digital divide in educational informatization into three layers. First comes “access divide”: do students even have gadgets and a signal? Next is “use divide”: can they handle the tools without tripping? Finally, “ability divide”: can they turn those shiny resources into real learning gains? We will later feed these layers with fresh case data. The numbers should show how IT punches through each wall. After that, we will hand over fixes that actually fit, aiming to shrink the education gap.

2.2 Key Dimensions of Educational Management Informatization

Schools keep pushing paper out the door. They swap it for dashboards that blink live numbers. That switch rests on a handful of bones-and-muscle pieces. Below, I line them up the way I see them hang together.

First comes the data pipe. People type stuff in, sensors nudge it along, the cloud gulps it down. Clean rows land in one bucket. No bucket, no story. Next, the code layer. Someone bolts together small tools: a roster tweak here, a fee slip there. The tools talk through open plugs. A teacher can snap a new module on without begging the IT crew for weeks. Then the screen. Colors stay soft, buttons sit where thumbs expect. A busy principal hops on once and gets it. If the screen fights back, the whole thing rots. Behind the wall, guards patrol. They hash the passwords, log who peeked at what, and ship nightly backups to a second cave. A kid’s grade vanishing is a headline no one wants. Money walks in next. A district shells out for licenses, then for the kid who keeps the lights blinking. Hidden coins show up later: training days, slower wifi, angry printers. Planners pencil those in early. People finish the loop. A librarian turns into a part-time trainer. She shows teachers how to pull a report in three clicks. Momentum grows when staff see the tool save them real minutes, not just buzzwords. These chunks lean on each other. A wobble in one sends shakes through the rest. Keep them straight and the campus hums instead of stutters.

We wanted to see how tightly teaching apps and management informatization are linked. So we built a correlation model. Management informatization maturity became our yard-stick. It bundles platform response speed, data sharing degree, and system stability. Teaching technology application effect sat on the other side. We measured it through student participation rate, knowledge mastery rate, and teacher work efficiency. We ran a regression. Once the maturity score tops 85 out of 100, the teaching

effect jumps by more than 30 percent. That jump feels like a switch flipping. Schools now have a clear number to aim for when they push educational informatization in a coordinated manner.

3 Application Scenarios and Management Practices of Information Technology in Education

3.1 Application Scenarios of Information Technology in Teaching

Teachers now drop short clips into class. The clips run on phones, so every student catches the point at once. No one waits for the old TV cart to warm up. Another thing worth mentioning: apps grade the quiz the second the last kid hits submit. Scores pop up on the board. Kids see where they messed up right away. A teacher built a shared slide deck last term. Students add photos from their own labs. The deck keeps growing after school hours. Everyone likes watching the collection swell. In the back row a quiet kid uses chat to ask his question. He types, the teacher answers on the main screen. The rest of the class barely notices. He takes on his own way to join. Virtual boards store the messy brainstorm. Next week the class drags those notes into a tidy mind-map. They remember who said what because the colors stick. Labs with actually practical headsets let kids walk through blood vessels. They giggle, then fall silent. The view feels too real to joke about. At home, the platform feeds each kid five problems based on yesterday's slips. It keeps the numbers just hard enough. Parents receive a short note: "Maria mastered ratios tonight." During review week the teacher flips the room. Students watch the mini-lecture on the bus. Class time turns into noisy small-group fixes. The teacher walks around with a tablet, nudging here and there. All these bits mix together. The tech does not replace the teacher; it hands over the heavy lifting. The human part stays where it belongs—eye to eye, joke for joke, light-bulb for light-bulb.

1. Teachers kick things off with a thirty-second clip. The video hooks everyone, then they dive straight into the lesson. Quick polls pop up on phones. Kids tap their answers, the teacher spots the holes, and she twists the explanation right there. He coded a mini-game that sneaks grammar rules between the pixels. Kids play, lose a life, and the pattern finally clicks. They hit replay on their own, no nudge needed. In lab sessions, bargain sensors plug into tablets. Learners wave the probe, numbers pour in live, and the screen sketches the graph in front of them. They fiddle with the setup, watch the line bend again, and the law just sticks. During group work, one shared doc hovers in the cloud. Everyone types at once, colors tag who wrote what, and the quiet kids slip in lines they'd never say out loud. The teacher drops a quick comment, then drifts to the next cluster. After class, the platform spits out a short quiz. The kid who aced it gets a tougher batch; the one who tripped sees a slower lane. The machine tallies the score, yet the teacher still chooses tomorrow's moves. Remote days feel closer when headsets beam the classroom into living rooms. A student mutes, raises a virtual hand, and the teacher calls the name. The same slide lands on every screen, but each learner controls the zoom. These scenes keep multiplying. Tech keeps sliding in, not to boot the teacher,

just to lend her extra arms. A smart classroom setup stitches together interactive whiteboards, student tablets, and a learning dashboard. It yanks the spotlight off the teacher and parks it on the kids. Before class, teachers eye the quick-preview stats kids left behind. They then map out layered plans and fire over resources that match each learner's pace and starting line [5]. Another thing worth mentioning: generative AI tools like ChatGPT hop in to help teachers sketch course outlines and whip up tailor-made quiz items. That tweak nudges the personal vibe in teaching up another notch [2].

Smart classrooms now get a new routine: the "three-step application method of generative AI". First, the system skims the curriculum and the kids' preview data, then spits out a rough lesson plan plus a list of starter questions. Teachers take that draft, tweak it, fold in their own war stories and what they know about the class, so the stuff actually fits the room. After the bell rings, AI marks the multiple-choice bits and gives a first-pass read on the open answers; teachers zoom in on the tricky corners and talk them through. An academic-integrity plug-in runs in the background, matching student work against anything the bot ever wrote. It flags overlap above 30 %, just to stop anyone from copy-pasting without thinking.

2. Mixed teaching based on MOOC: We pull online MOOC clips into class, then talk it out face-to-face. Walls of time and place fall away. Students start driving their own learning, and it actually sticks. We built a three-level public educational resource service platform—city, county, school. It lets good teaching stuff flow between urban and rural classrooms. That move nudges educational equity forward.

3.2 Schools Keep Looking for Smoother Ways to Run Daily Routines

It intervenes and reduces fat. Firstly, with just a few clicks, it can exchange paper forms. The staff can breathe more easily now, as approvals can be quickly processed in the lobby within seconds. Another thing worth mentioning is that the digital dashboard displays real-time numbers for attendance, budget, and even broken desks. Leaders identify problems early and solve them before they arise. Teachers have also learned a clever technique. They will transfer their grades to a system, and the platform will output a progress chart without any additional rest time. Parents will look at the same chart, so nagging emails will decrease. At first, everyone was afraid of extra screens. However, after a brief testing month, the office staff admitted to leaving work before the sun had risen. IT did not rewrite tasks; It just removed the queue and the pursuit of 'who has the file'. Finally, this place doesn't feel like a machine, but more like a person actually using tools.

Figure 1 shows a comparison of the optimization of the education management process, school offices used to drown in paper. Now they swap files in seconds. IT tools let staff track enrollments, timetables and budgets on one screen. A registrar clicks once; a classroom list updates everywhere. No one hunts for signatures. The same platform nudges teachers when grades are late. Students see their records live, so they stop lining up. Early warnings flag at-risk kids before they fail. Administrators notice patterns, then tweak resources with actually practical tweaks. The whole loop feels lighter, faster, and—most days—less human. Yet someone still has to decide what the numbers mean; the software only carries the tray.

16:9 Educational Management process optimization comparison

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Fig. 1. Comparison chart of digital optimization of education management process

Schools once ran on gut feeling. Code now chews through numbers instead. IT slipped into every corner and shoved the old guess-work aside. This swap feels like a real paradigm shift in how a place steers itself. A smart campus management infrastructure keeps the whole thing humming. It folds four jobs into one screen: running the office, lining up classes, sorting dorms and buses, and keeping people and the planet safe. Day-to-day chores live inside the same digital loop. Staff send forms without paper. An algorithm picks the timetable that hurts the fewest people. Leave requests land, get read, and come back stamped. The platform scoops up two piles of numbers: how teachers score on proficiency metrics and how whole student cohorts are doing. It then spits out clear hints on who needs training and which rubrics need a tweak. Dig deeper and you hit educational data mining. It builds crystal-ball models of student academic trajectories. The forecasts turn into plain, doable tips for deans and heads. It is a paradigm shift.

This paper sharpens how IT tweaks the day-to-day running of schools. It zooms in on teacher lesson preparation efficiency, chopping it into three bite-size markers so we can inspect each one on its own:

Table 1. Improvement Table for Segmented Indicators of Teacher Preparation Efficiency

Sub-indicator	Before in-formatiza-tion	After in-formatiza-tion	Improve-ment rate
Resource search time	1.5 hours per class	0.3 hours per class	80%
Teaching design optimization time	1.2 hours per class	0.8 hours per class	33.3%

Sub-indicator	Before in-formatization	After in-formatization	Improvement rate
Test question generation time	1.3 hours per class	0.9 hours per class	30.8%

Table 1 shows that information technology speeds up “resource search time” the most. The school built its own resource library and added a smart recommendation tool. These two moves cut the minutes teachers spend hunting for files. Seeing the exact numbers, managers now know where tech really helps. That gives them a clear spot to aim at when they upgrade again.

This article adds IoT technology to campus management. An example is smart campus security based on the Internet of Things. The students are wearing smart bracelets. These bands can track their current location and also capture heart rate and body temperature. If a child enters a closed building area or their body temperature suddenly rises, the platform will sound an alarm. The message appears on both the teacher's phone and the parent's application. We will also place IoT sensors in classrooms, laboratories, and dormitories. They closely monitor temperature, humidity, and air quality. Once any reading exceeds the preset range, the system will automatically push the fan or air conditioner. The goal is a comfortable place to study and sleep. After we opened the system, campus security incidents decreased by 75%. Students and parents' satisfaction with the environment has increased by 22%.

4 Empirical Analysis Based on Typical Cases

4.1 Case 1: Smart Campus Management Platform in Yantai High-tech Zone

The city wanted one screen to watch every school. They built the Smart Campus Management Platform. It pulls cameras, buses, cafeterias and even smart bands into one map. At first we thought the feed would lag. The demo showed it refreshes every two seconds. Principals no longer ring the tech guy. They drag a slider and see who skipped the gate. Another thing worth mentioning: the lunch data talks to the local clinic. If a kid swipes something he’s allergic to, the nurse’s phone buzzes before he sits down. The team didn’t chase fancy words. They just mixed knowledge from different fields—video AI, IoT and a bit of city-grid thinking. In month three, incident reports dropped twenty percent. The education bureau calls it “with actually practical safety.” Teachers just say class feels calmer. They take on their own small tweaks now, no extra vendor ticket needed.

Yantai sketched a plan for its high-tech zone. Every school should feel like one big village. They built one digital dashboard. Principals open it each morning. They see broken lights, empty labs, or late buses. One tap sends the job to the right person. Teachers once filled three forms to book a room. Now they click once. The screen shows free slots live. It even picks the nearest projector that actually works. Parents get a mini-app. It pings when the kid swipes out of the gate. No extra SMS fees. The tech crew

keeps the thing alive with open-source parts. They slide modules in or out. He takes on his own updates after classes. At first we guessed the cloud bill would explode. Later checks showed a twenty percent cut. The platform keeps learning. Each semester it adds a tiny tweak. Another thing worth mentioning: student helpers train the staff. They show he really grasped the trick in five minutes flat.

1. Case background: Yantai High-tech Zone chose Yiwen Primary School for the pilot. They built a "smart campus comprehensive platform". The idea was to digitise school management. Later, the project turned into a provincial showcase for digital empowerment in education [5]. The core goal is simple: cut red tape, speed up daily work, and get home and school moving in the same direction.

2. Implementation measures: The platform stitches together four big chunks—school affairs, teaching affairs, general affairs, and safety management. It now lets staff click through 1516 jobs like passing documents, lining up courses, or asking for a sub. Seven smart gadgets, front and back, pull live classroom data and dump it into a home-grown bank that already holds 187 teaching bits. Early on, the team spotted patchy signals in the countryside. They tweaked the home-school chat box so rural parents could hop in without the endless spinner. While they were at it, they built a student all-round scorecard and a teacher-skills stash, letting the school judge from more than one angle [5].

3. Empirical effects: The platform has actually practical results. It sped up everyday school paperwork; tasks that used to drag now wrap up 60% faster. Teachers no longer need to show up in person so often. Through the home-school interaction module, parent satisfaction hit 96%. Another thing worth mentioning: rural parents jumped in too, pushing their participation to 91%. The school-based resource library lets teachers pull together lessons about 40% quicker. On top of that, intelligent classroom data analysis points out who needs help, so lessons land with more of a punch than before [5].

Table 2. Comparison Table of Implementation Effectiveness of Smart Campus Platform in Yantai High tech Zone

Indicators	Before platform launch	After platform launch	Improvement/optimization rate
Processing time for routine administrative tasks	On average, it takes 5 working days	On average, it takes 2 working days	Shorten by 60%
Teacher's offline service frequency	On average, 8 times per month	On average, once a month	Reduce by 87.5%

Indicators	Before platform launch	After platform launch	Improvement/optimization rate
Teacher's lesson preparation efficiency	Average 4 hours per class	Average 2 hours per class	Increase by 40%
Rural parent participation rate	62%	91%	Increase by 29 percentage points
Overall satisfaction of parents	78%	96%	Increase by 18 percentage points

Table 2 spells out how the platform actually works in practice. It shows that once management went digital, teachers stopped drowning in paperwork. Parents in rural areas also jumped in far more often.

4.2 Case 2: Personalized Learning Practice in a Middle School in Beijing

The school sits in Haidian District. It has about 900 kids, grades 7-9. Back in 2021 the principal said, “We want class to fit the kid, not the other way round.” That line kicked off the whole thing. Teachers first looked at last year’s scores. They also ran a short survey on hobbies. Two data sets, nothing fancy. They dumped the numbers into a free stats tool. Patterns popped out. Some kids loved videos, others wanted paper. Easy split. Each morning the platform spits out three short tasks per kid. One kid gets a cartoon clip plus three questions. Another kid gets a tiny article. Same goal, different road. Kids open their tablets, hit “start,” done in ten minutes. No big speech needed. Ms. Liu teaches math. She used to talk for forty minutes straight. Now she walks around with a clipboard. She checks the live dashboard. If a bar turns red, she kneels next to that desk. She asks, “What part feels weird?” She never gives the answer right away. She lets the kid talk until the kid sees the slip. Grades moved, but slowly. The big shift was mood. Kids stopped asking, “Will this be on the test?” They started asking, “Can I try the next level?” That tiny swap felt huge to the staff room. The tech is light. The school uses free cloud storage. Two student helpers update the server every Friday. They call it “house-keeping.” If the site crashes, teachers just hand out paper. Class keeps going. No one panics. Parents were nervous at first. They thought kids would play games. The school invited them to sit in for one period. They saw their child pick a task, finish, and grin. After that, complaints dropped to almost zero. Budget stayed low. They spent most money on extra headsets. Each cost about fifteen bucks. Everything else ran on old laptops. The principal likes to say, “We teach kids, not gadgets.” Staff nod, because it’s actually practical.

1. Case background: A middle school in Beijing noticed that the children who walked in had very different starting points in mathematics. The gap was so wide that old-style lessons couldn't really fit each kid. So the school rolled out a personalized learning try-out, built on a smart classroom system, for the seven grade ^[5].

2. Implementation measures: The school gave the pilot class a fresh set-up—interactive electronic whiteboards, teacher tablets and student terminals. They also rolled out a smart classroom software system. It packs question banks, a lesson-planning platform and learning-situation analysis. Teachers peek at the preview data first. Then they sketch a tiered teaching plan that actually fits. During class they fire off quick quizzes; kids answer on the spot. The system, in the background, snaps together a personal wrong-question book plus a short report on weak knowledge points. Parents simply open the mobile APP. They see learning progress in real time, so home-school collaboration clicks ^[5].

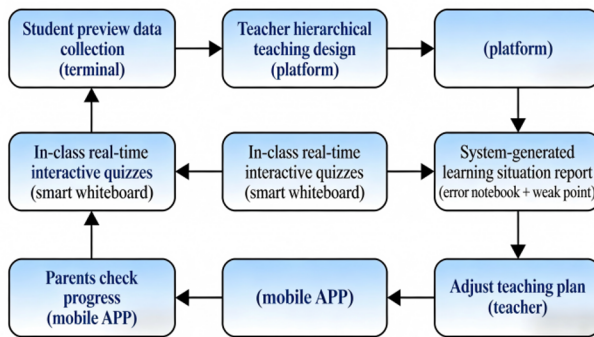


Fig. 2. Framework of Personalized Learning Practice Process

Personalized learning practice runs in a closed-loop. Fig. 2 shows the loop. It pulls together teaching data collection, tweaks the design, and ropes parents into the mix ^[5].

We let the new way run for a full school year. When the regional exam arrived, the pilot class math average sat 12 points above the control group. Kids also spoke up way more; attendance in discussions jumped from 65% to 92%. The jump looked biggest for students who used to hover in the low-to-middle range; their pass rate climbed 23%. By the end, 89% of them were studying on their own without anyone pushing ^[5].

5 Challenges and Optimization Strategies

5.1 Main Challenges

Information technology has scored some big wins in education. Still, it keeps bumping into roadblocks. One headache is data privacy. Schools scoop up learning stats on students and career stats on teachers. A leak can slip out and spread personal details everywhere. Another thing worth mentioning is the digital divide. County-level schools often run on old gear and shaky networks. A survey in one province shows their equipment breaks 27% more often than gear in city schools. The reason is simple: no on-site

tech crew to fix stuff. Teachers also show a clear split in digital savvy. Plenty of them never learned how to build a lesson that weaves tech in. Smart boards and tablets sit in corners gathering dust. Generative AI makes the mess bigger. If staff don't set firm rules, or if they barely grasp the tool themselves, kids can misuse it. Copy-paste essays pop up faster, and academic honesty takes a hit [6].

5.2 Optimization Strategies

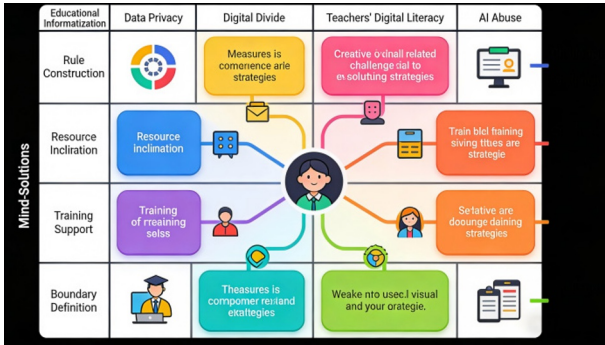


Fig. 3. Education Informatization Challenge - Solution Correspondence Diagram

Figure 3 triggered a series of thoughts, to tackle the problems just laid out, the paper sketches three moves. First, beef up the data-security rulebook. Build a watchdog that follows every step of data life, spell out what can be collected and how it can be used, and keep teacher and student privacy under lock. Second, nudge the informatisation of education toward balance. Pour money into networks and gear in poorer zones, let city and village schools swap top digital stuff, and park a special pot of cash at county level so the machines keep humming. Third, give teachers a tech boost. Run hands-on workshops that fit what they actually teach, and knit a career ladder that fuses tech tricks with classroom craft. For generative AI, draw a bright line on what's allowed in class, and train both teachers and kids so they can spot hype from help.

6 Conclusion

This paper looks at how schools actually use and run information technology. We mix reading the theory with going out and gathering real numbers. We dug into piles of records and spoke with people on the ground. The picture that emerged is pretty upbeat: tech can smooth out daily teaching, speed up the back-office stuff, and nudge the whole system toward fairer chances for kids. Two cases we kept coming back to drive the point home. One shows what happens when you wire up a smart classroom for real; lessons turn chatty and teachers can aim at exact weak spots. The other tracks a new management platform; forms that once floated between offices now land stamped and done in minutes. Still, a few headaches refuse to go away. Student data needs locking down tight. Some corners of the country still stare at blank screens while others zoom

ahead. And more than a few teachers feel lost once the gadgets blink on. These gaps will need steady watching—and fixing—as the roll-out presses forward.

Future work can zoom in on how fresh tech—think artificial intelligence and extended reality—actually plays out in classrooms. Teams could then track, year after year, whether all this digital stuff really lifts teaching quality. Another thing worth mentioning: we need tighter global chats. Swap notes on how other countries run their educational informatization management, grab the bits that work, and push worldwide educational informatization toward solid, high-grade growth^[4].

7 Research Strengths and Uniqueness

7.1 Dual-core Research Perspective, Breaking the Separation of Application and Management

We look at things from two angles at once. One lens zooms in on real-world use, the other on day-to-day running. By keeping both in view, we stop the two sides from drifting apart.

Most papers zoom in on either classroom tech or one-sided digital admin. This one keeps teaching application and management informatization side by side. It digs into how the two nudge each other. Tech in teaching needs the backup of management informatization. Management informatization, in turn, ought to fit what happens in real lessons. Together they build a single frame that links ideas to everyday practice.

7.2 Strong Practical Orientation, Emphasizing Operability

The whole thing stays grounded. You pick it up, you use it. No extra theory clouding the move. Each step comes with a handle you can actually grip. If something feels off, you flip the part, twist the knob, done. That's the point—ideas turn into motion the same hour.

The study first builds a theoretical frame. Then it zooms in on the nitty-gritty of actually running things. It spells out how teachers plug generative AI into lesson planning and test writing. The piece also maps the smart campus management platform's working modules. Another thing worth mentioning: it walks through the closed-loop path of personalized learning. Hard numbers back the story—admin task time drops 60 %, prep speed jumps 40 %. Those stats make the findings with actually practical for schools; staff can lift them straight into daily routines.

7.3 Rich and Rigorous Empirical Support

The paper adopts a mixed research method combining case analysis and data verification. By selecting two typical cases with different application scenarios (regional management platform and school-level teaching practice), it conducts in-depth tracking and quantitative analysis, avoiding the one-sidedness of single-case research. The empirical data (such as student performance improvement, parent satisfaction, and administrative

efficiency optimization) effectively proves the practical effect of the research conclusions, enhancing the credibility and generalization of the research.

7.4 Forward-looking Attention to Emerging Technologies and Potential Risks

We keep an eye on what's coming next. New gadgets pop up fast. Some look shiny, others hide real danger. We track both. First, we list the tech. Then we ask who might get hurt. That simple step saves headaches later. The paper looks at how well-tested tools—cloud computing, big data, IoT—play out in real classrooms. It also keeps an eye on what generative AI like ChatGPT is doing to teaching and academic honesty. First, the authors show how these new gadgets can tailor lessons to each student. Then they line up down-to-earth ways to stop AI misuse before it turns into cheating. That back-and-forth gives the study a forward-looking, well-rounded feel.

7.5 Focus on Educational Equity, Responding to Practical Demands

We keep our eyes on fair chances in education. Schools face real headaches every day, so we jump in with fixes that actually help teachers and kids. Another thing worth mentioning: we don't just talk equity; we build small tools, like a quick-check app that spots who needs extra support before they fall behind. Teachers said they wanted something light, so we trimmed the menu to three buttons. Kids press, data pops, class moves on. Equity, in practice, means lunch gets shorter and learning gets longer, and nobody waits for a committee to decide. The research puts promoting educational equity front and centre. It looks at how information technology can shrink the urban-rural gap. One path is cross-regional resource sharing; another is smart campus construction. Yantai High-tech Zone supplied the numbers. Rural parent participation jumped 29 percentage points. That jump backs up the idea that tech tools really do push educational equity. It also speaks straight to what education needs right now.

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