Timely

Bellwether

Built for Learning: How Timely Uses Artificial Intelligence to Streamline Scheduling

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Series Overview: The integration of artificial intelligence (AI) into ed tech tools has raised myriad questions about how such advanced technology can both ease burdens for students and teachers and facilitate deep learning. Building on Bellwether's prior work examining how AI could amplify productive struggle and how to measure the impact of AI-powered ed tech tools, this case study series showcases those concepts in practice by spotlighting select organizations and describing their design approaches, trade-offs, and implementation choices. The case studies in this series are drawn from interviews conducted with organization leaders in summer 2025, and each profiled organization reviewed its case study for accuracy in October 2025. **Learn more by reading Bellwether's Built for Learning series.**

A Case Study on Timely

Introduction

Every school year, middle and high school assistant principals and counselors spend upwards of 100 hours to build a master schedule that assigns students and teachers to their classes.[1] Created by former educators and school administrators, Timely is an AI tool designed specifically to solve the master scheduling problem. Roughly 80% of a school's budget is spent on personnel,[2] and the master schedule dictates how the majority of those human resources are utilized, making the master schedule key to implementing a school's priorities. Timely works not only to help schools and districts quickly create a master schedule that meets hard constraints (e.g., number of rooms or class size) but also to increase the alignment between the master schedule and a school's priorities (e.g., common planning time, increased support for students with special needs).[3] Timely stands out among other ed tech organizations as an example of:

1. A specific, targeted, and scalable solution for school operations.
2. A product design that focuses on outcomes beyond pure time savings.
3. When machine learning may be preferable to generative AI (GenAI).

From Issue to Impact

Historically, master school schedules are a time-consuming, manual process involving a mix of spreadsheets, whiteboards, and paper charts.[4] It is difficult for school administrators to create a master schedule that does the minimum to map class schedules, let alone balance other school priorities such as finding common time for teachers to collaborate.[5] Timely works by automating this cumbersome organizational process to better align the master schedule with a school's priorities.

Timely walks users through a prioritization process.

Key to Timely's process is having school staff identify constraints (or trade-offs) as part of the multistep scheduling process.

Step 1: Collect student course requests. The process starts with students working with a guidance counselor to select courses. Counselors help ensure that student requests are aligned with graduation requirements and course pathways and that they reflect the student's interests.

Step 2: Establish scheduling inputs and constraints. Schedulers set parameters that reflect school realities and policies, such as classroom availability, teaching assignments, and course capacity guidelines.

Step 3: Use Timely to build the master schedule. Timely's optimizer algorithm produces an initial schedule that meets as many priorities as possible within the defined constraints. The platform balances competing needs while maximizing student access to desired courses.

Step 4: Review and refine. Once Timely generates a draft schedule, administrators can adjust and test variations. The system supports iterative refinement as schools gather feedback or update requirements.

This allows administrators to generate different master schedule scenarios quickly, deciding where to — and when not to — compromise.

Timely measures impact beyond pure time savings.

The ability to streamline generating different options for the master schedule saves time but can also help school leaders more easily put into practice the school's educational priorities. More consistent class sizes and efficient schedules allow school administrators to redistribute those savings elsewhere, such as additional support staff for students with special needs or additional opportunities for teacher collaboration. Timely CEO and Co-Founder Paymon Rouhanifard said, "Most budgets are personnel. How your people are interacting with students and deploying them is everything. The master schedule governs those interactions."

To measure impact, Timely collects reports from users, such as the number of staff hours saved, the percentage of students fully scheduled, the percentage of students who have their core course requests met, or savings in the number of full-time equivalent (FTE) teachers.[6]

Other types of outcomes schools may anticipate will vary depending on what schools decide to prioritize throughout the scheduling process. For instance, a school that prioritizes teacher collaboration may see an increase in instructional coherence across a subject area or increased teacher retention.

Using AI With Intention

Timely intentionally uses more traditional AI models than GenAI tools.

Timely uses a constraint satisfaction and optimization algorithm, a form of machine learning, to generate master schedules.[7] The advantage of the algorithm is that, unlike GenAI models, it integrates a school's constraints from the start. This is important as the master schedule is filled with hard constraints, such as a certain number of rooms or maximum class sizes. By using a machine learning model instead of GenAI, Timely avoids hallucinations that could result in scheduling errors such as double-booking a student. If Timely were to use a GenAI approach, it would require substantial model training to reduce the likelihood of errors, which would be difficult to do because each school has different underlying data (e.g., course offerings, bell schedules).

Timely balances data privacy, product quality, and research.

Timely is delivered as software. Districts connect their student information system to the software either by API (a standard way for systems to exchange data) or by uploading data files. For the program to work best, the incoming data (e.g., student course requests) needs to be complete and accurate.[8]

Schools own the data that is put into the software; however, the Timely master services agreement does allow Timely to create aggregated, de-identified datasets.[9] Timely can use those datasets to evaluate and improve the quality of the prediction algorithm and engage in research.[10]

Amplifying Learning

A more effective schedule can be a tool to advance student learning.

Increased time for teacher collaboration is a common priority among schools, but it can be difficult to find common time in the schedule. Historically, schools would set aside a certain class period for teacher collaboration that would stay consistent year after year (e.g., all science teachers have prep time during second period, all math teachers have prep time during third period). The challenge then becomes that as student needs change, there is less flexibility to accommodate those shifts. With Timely, the master schedule can become more responsive to evolving student and teacher needs.

Beyond teacher collaboration, scheduling can better support students with additional needs, such as students with disabilities or English learners.[11] For instance, schools may design more efficient inclusion classes for students who need more support. As Rouhanifard described it, "Building inclusion classes is the hardest part of building a master schedule, as it is almost a schedule within a schedule. We often look at how to slot in students and co-teachers, and it ends up being random and haphazard with learning specialists stretched across content areas. Building that in as a proactive solution is how to best support students who are most vulnerable." Schools may use a similar approach for English learners to proactively build the schedule to ensure that they are placed in core content area classrooms. Likewise, schools can set the number of students receiving special education or language services in each course section to balance student loads at the start of the school year.

Schools may also use scheduling to implement programs designed to improve student achievement. For instance, Lubbock Independent School District in Texas used Timely to implement a double-block schedule for English language arts (ELA) and math at the middle school level aimed at increasing math and ELA achievement.[12]

Finally, staff from Timely noted that better scheduling has the potential to improve student engagement in academic planning. When students get the courses they choose, they are more likely to trust the process and feel ownership and agency in their education.

Conclusion

Timely is exploring using GenAI to help guide users through the scheduling process. A user-facing tool could show how small adjustments lead to a better schedule, allowing it to "fall into place like a beautiful Tetris game."[13]

While exploring generative AI to support users, Timely will continue to use its constraint satisfaction and optimization algorithm to generate the master schedules. The algorithm is advantageous both in its technical properties and how it requires school staff to consider trade-offs within the master scheduling process. This process of exploring trade-offs in Timely not only saves school staff time, but also helps the master schedule better serve students and reflect a school's priorities. ✦

Endnotes

1 Interview with Paymon Rouhanifard, April 10, 2025; Amanda Lu, Paymon Rouhanifard, Christopher Cleveland, Ev Gilbert, and Susanna Loeb, *The Key Resource of Time: Master Schedules and Effective Allocation of Students and Educators* (Stanford Accelerator for Learning—SCALE Initiative, March 2025), https://static1.squarespace.com/static/645d110ab878a54b2b9e4165/t/67e6cc80f2cc5629d831909b/1743178880835/Research%20Brief-%20The%20Key%20Resource%20of%20Time-%20Master%20Schedules%20and%20Effective%20Allocation%20of%20Students%20and%20Educators.pdf.

2 Institute of Education Sciences, *Revenues and Expenditures for Public Elementary and Secondary School Districts: School Year 2021-22 (Fiscal Year 2022)*. Table 2. Current expenditures and current expenditures per pupil of public elementary and secondary school districts, by region, state, and two largest school districts by enrollment in each state: Fiscal year 2022, 16, https://nces.ed.gov/pubs2024/2024309.pdf.

3 Timely Schools Inc., "Solutions," *Timely*, accessed October 16, 2025, https://www.timelyschools.com/solutions.

4 Lu, Rouhanifard, Cleveland, Gilbert, and Loeb, *The Key Resource of Time: Master Schedules and Effective Allocation of Students and Educators*.

5 Andrea Clay et al., *About Time: Master Scheduling and Equity* (Center for Public Research and Leadership, 2020), https://cprl.law.columbia.edu/sites/cprl.law.columbia.edu/files/content/Publications/Final%20About%20Time%20Report_Final%20Report.pdf.

6 Lu, Rouhanifard, Cleveland, Gilbert, and Loeb, *The Key Resource of Time: Master Schedules and Effective Allocation of Students and Educators*; *Using the School Schedule to Improve Special Education Instructional Delivery & Staffing Efficiencies* (Richardson Independent School District, Timely, The Commit Partnership, and Mesquite Independent School District, n.d.), https://static1.squarespace.com/static/645d110ab878a54b2b9e4165/t/672105a4af8b322f04aabfbd/1730217381036/Timely%2BCase%2BStudy%2BFinal%2B%282%29.pdf; *Transforming Scheduling Across a Charter Network* (Timely and Noble Schools, n.d.), accessed October 16, 2025, https://static1.squarespace.com/static/645d110ab878a54b2b9e4165/t/67c76018fff401535963af17/1741119512684/Timely-WP-Noble%20Schools.pdf; Interview with Timely staff, October 14, 2025.

7 Interview with Faisal Anwar, October 14, 2025.

8 As noted earlier, to increase accuracy, students should work with guidance counselors in creating their course requests to help ensure that the requests are reflective of graduation requirements, course pathways, and student interests. The school must also have accurate data regarding the constraints (e.g., teacher teams) and be able to articulate the school's priorities within the scheduling process.

9 The agreement states that Timely has a "perpetual, irrevocable right and license to copy, modify and use Client Data to create aggregated, non-personally identifiable data or information . . . for benchmarking, product development, research or development purposes, including published research." "Master Service Agreement," Timely Schools Inc., https://www.timelyschools.com/msa-dsa.

10 Ibid.

11 See *Using the School Schedule to Improve Special Education Instructional Delivery & Staffing Efficiencies* (Richardson Independent School District, Timely, The Commit Partnership, and Mesquite Independent School District, n.d.).

12 *Unlocking Resources Through Scheduling: How Lubbock Independent School District Used Scheduling to Enable Instructional, Staffing, and Budget Priorities* (Lubbock Independent School District, Timely, and Education Resource Strategies, n.d.), https://static1.squarespace.com/static/645d110ab878a54b2b9e4165/t/6555387118be836c8a0364e5/1700083826183/Timely-WP-Unlocking%2BResources%2BThrough%2BScheduling.pdf.

13 Interview with Orion Smith, October 14, 2025.

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About Bellwether

Bellwether is a national nonprofit that works to transform education to ensure young people — especially those furthest from opportunity — achieve outcomes that lead to fulfilling lives and flourishing communities. Founded in 2010, we help mission-driven partners accelerate their impact, inform and influence policy and program design, and bring leaders together to drive change on education's most pressing challenges. For more, visit **bellwether.org**.

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