



Tandem: A web-based tool for supporting students in teams (and the instructors who love them)

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Opportunity/Theoretical Underpinnings

Teamwork is best taught through experience. Experiential learning requires we close the loop through reflection; permitting/encouraging bad team habits just entrenches that learning for students.



Groups of students don't become teams magically. Collaborative learning often has inequitable outcomes, especially for already-marginalized students.

Kolb's Cycle of Experiential Learning (applied to teamwork)



Current Status

UM Office of Academic Innovation built it!

An OAI team of behavioral scientists, developers, usability/designers, and data scientists have taken and improved/built on the surveys and reflections we used in our first year engineering course. They have created a platform for:

Gathering information (and encouraging reflection)

- Short "team temperature" surveys
- Longer peer-feedback surveys
- Beginning-of-project survey of personality traits, teamwork preferences, and work habits
- End-of-project survey of team/project experiences

Providing formative feedback to teams

- Visualizations of team temperature surveys
- Visualizations of peer/self feedback
- Teamwork "coaching," tailored based on initial, team temperature, and peer feedback surveys [tailored both by topic-- some teams will see particular lessons and others won't-- and by content. Tandem uses the Michigan Tailoring System to adjust messaging for individuals based on algorithms we pre-specify]

Encouraging reflection on teamwork experiences

- Visualizations to enable students to compare their own assessment of team performance to others'
- Reflection prompts encouraging students to consider how their teamwork behaviors have met their own goals, or how they can improve to do so in the future
- Reflection prompts on each lesson to encourage students to apply teamwork lessons to their own context

Semester begins

This example class has weekly check-ins and lessons; two major peer evals.

Each loop = 1 week



Semester ends

Surveys

Beginning-of-term survey: Personality, group/team preferences, work preferences, self-efficacy, belonging, academic motivation, housing, schedule

Team temp survey: Quick (5 items): Working well, sharing workload equally, sharing ideas, logistics, confidence

Peer feedback survey: For self and others, rating contributions, reliability, ease of working with. Questions intended to assess overall inequality of workload (social loafing) as well as group communication (balance, voice safety), task allocation (making sure students divide up work equitably; all students share 'desirable' and 'undesirable' tasks)

Teamwork lessons

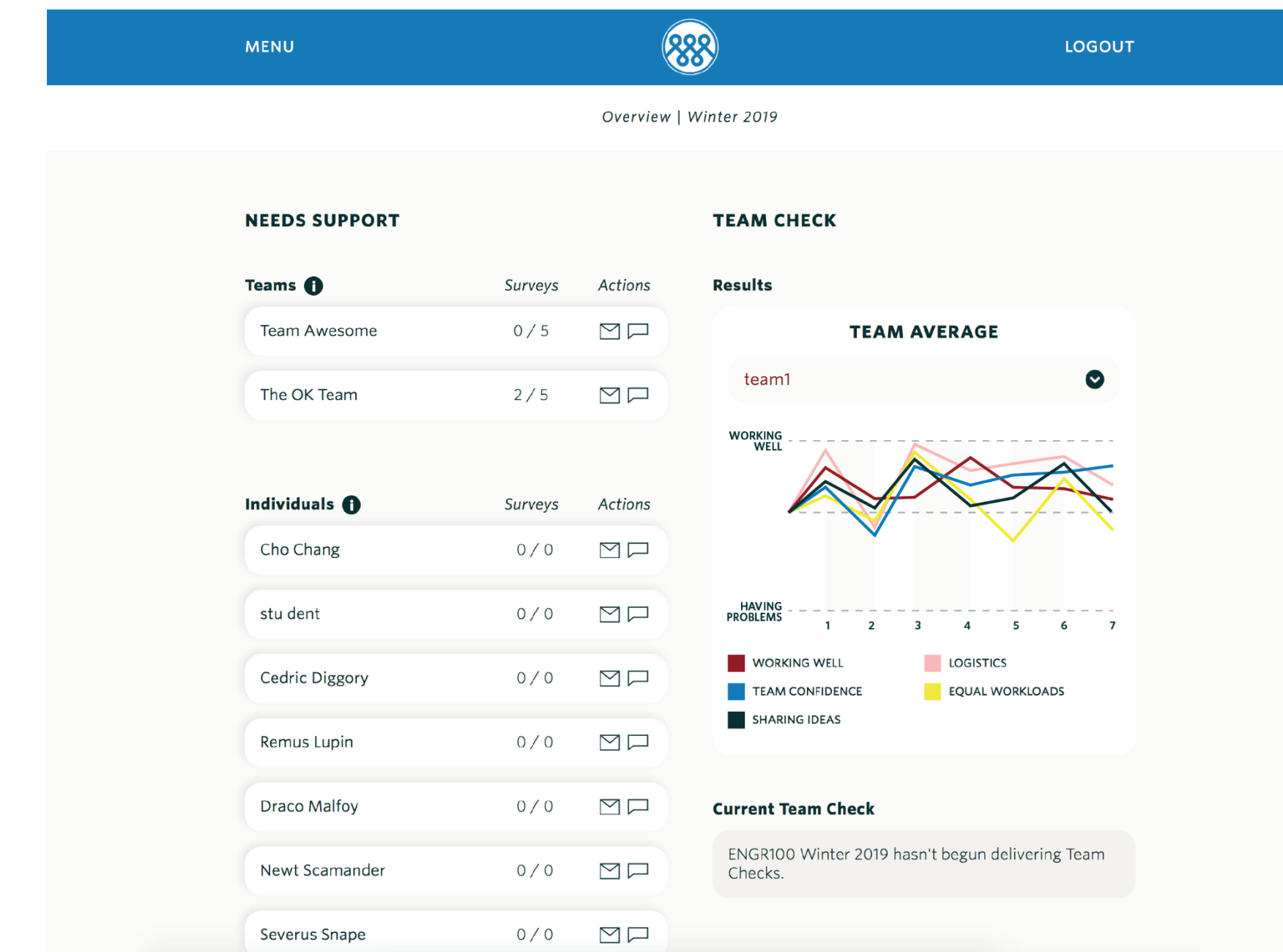
Short lessons on teamwork and teamwork-adjacent topics, framed by behavioral scientists to encourage positive behavior changes
Ex topics: Imposter syndrome, trust on teams, giving & receiving feedback. All topics include reflections
Tailored based on

Visualizations

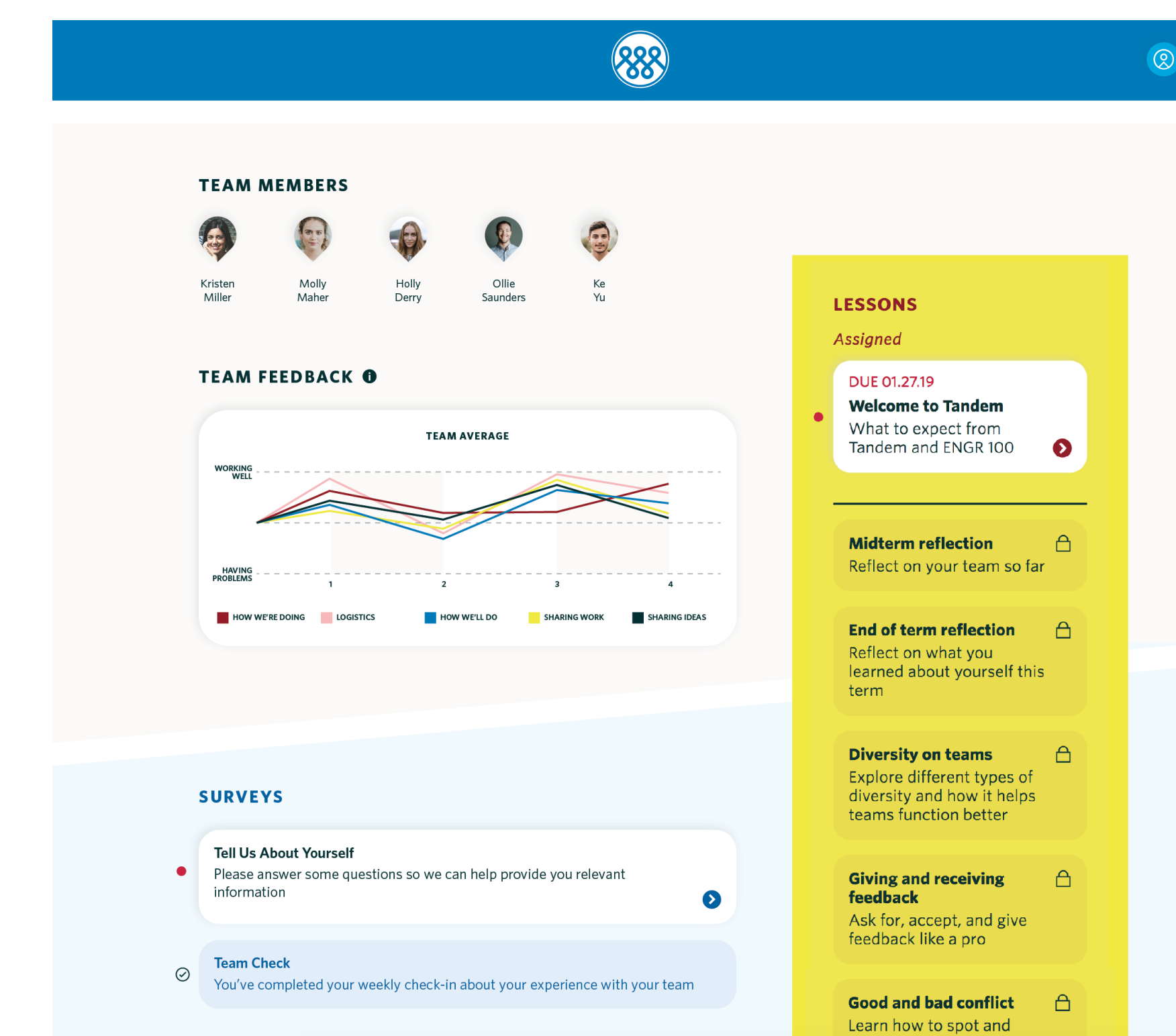
Weekly team-level visualizations based on team checks; shows aggregate team score only, over time. Tailored based on

"Meet your team" visualizations, tailored based on

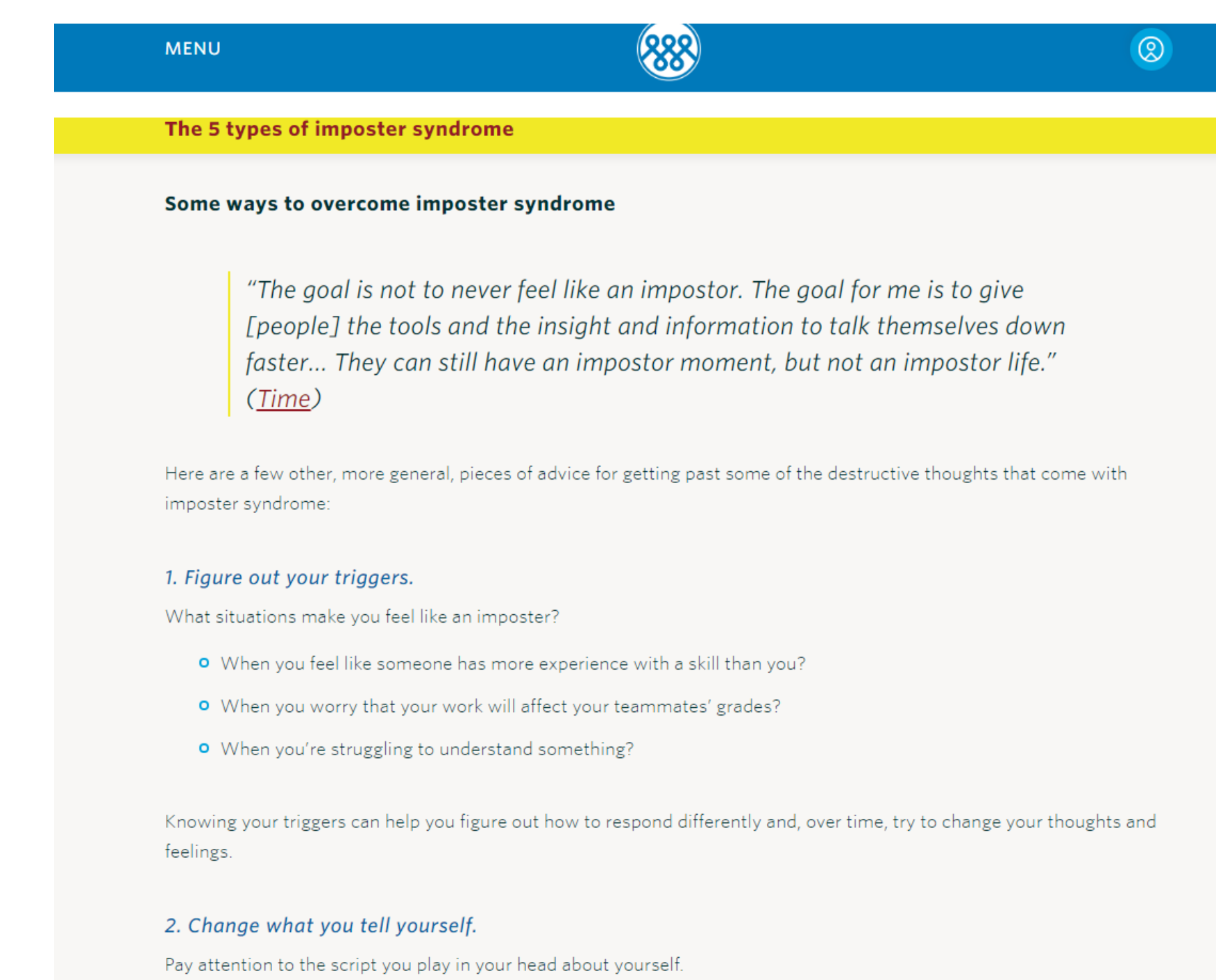
"Reflect on your team performance" visualizations/lesson/reflection, based on



Faculty view helps us understand how teams are doing



Student view shows them aggregate info from their own team



Lessons provide tailored team "coaching"



Thank you to the Office of Academic Innovation and especially to the amazing development team!

Thank you to the many students and faculty who have provided insights into what might make a tool more useful and accessible!

Thank you to the students who are patient with the alpha-version of Tandem now (and the inevitable hiccups of an initial implementation)!

Future Plans

In the works

- Continue to pilot/revise existing content
- Make available to more courses at UM and beyond
 - Winter 2019: Engr100-600
 - Fall 2019: Engr 100-600, Phys140, Taubman Architecture Graduate Studio
 - Winter 2020: ??? Contact Molly Maher (mmarymol@umich) if you are interested!

For the future

- Add a team formation tool
- Add element(s) of natural language processing and/or group communication analysis, so that open-ended student input can be used to tailor content
- Integrate with other tools (Canvas, GoogleDocs, a chat platform) to optimize user experiences and to allow additional teamwork metrics
- Integrate machine learning so that the tool can evaluate relationships not pre-specified by researchers; Use the platform to test efficacy of various interventions for improving team experiences