Spartan Studios Playkit

Tools and plays for better experiential interdisciplinary teaching and learning in courses.

An accessible version of this file is available at https://iteach.msu.edu/pathways/259/playlist#
Spartan Studios are experiential interdisciplinary courses at Michigan State University where students respond to real life situations or wicked problems and design solutions in partnership with local stakeholders.

Faculty members design and plan these courses with support from the Hub for Innovation in Learning and Technology, and we want to expand the number of experiential course offerings across campus. By experiential, we mean that students learn through experience as well as reflecting on their experiences.

Studios experiences support student success by providing more accessible high-impact educational practices. Interdisciplinary courses are co-taught by multiple faculty members from different disciplinary backgrounds and/or departments across campus, exposing students to approaches/methods not normally part of their major.

These courses are a response to the siloed university and complement students’ developing disciplinary training.
This playkit, a combination of playbook and toolkit, is a resource for faculty interested in developing their own Spartan Studios course or expanding aspects of their interdisciplinary, experiential teaching.

This resource was developed by the Spartan Studios project over 2020-21 with extensive feedback from MSU faculty members and external partners, as well as with consultations on experiential education programs at other institutions.

You will find descriptions of:

**PLAYS**
Our best practices for planning, implementation, assessment, and evaluating your experiential course.

**TOOLS**
Resources for developing elements of your own experiential interdisciplinary course.
How to use this PLAYKIT

We encourage you to approach this Playkit in a spirit of experimentation as you think through your own potential Studio course and reflect on how these components could inform your teaching and impact your students.

Our research suggests that the arrangement of components we present here following the Studios model can lead to transformative student outcomes, and we’ve compiled an Appendix of emerging scholarship on these benefits.

We’ve also observed that faculty members who incorporate a few or only one of these evidence-based practices can still generate benefits to student outcomes. If designing an entirely new experiential course is too much, you have the option to treat these as choose your own adventure suggestions for experiences that students tell us matter to their learning and growth beyond MSU.
How to use this **PLAYKIT**

The Hub runs annual workshops on experiential, interdisciplinary teaching and how to plan and teach your own Studio course. You are welcome to [connect with the Hub](https://d2l.msu.edu/d2l/le/content/1335409/viewContent/10564563/View) if you have questions about elements of the Playkit or how to apply them in your own teaching.

Other formats for this information:

- #iteachmsu playlist of articles [https://iteach.msu.edu/pathways/259/playlist](https://iteach.msu.edu/pathways/259/playlist)
- 2021 Spring Conference presentation video [https://d2l.msu.edu/d2l/le/content/1335409/viewContent/10564563/View](https://d2l.msu.edu/d2l/le/content/1335409/viewContent/10564563/View)
Step by Step to a Studios Course

or select components to help improve student outcomes in an existing course.
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CO-TEACHING
Studios courses are interdisciplinary

Spartan Studios courses are interdisciplinary. Students and faculty benefit from interacting and collaborating with other disciplines. Working across disciplines is an opportunity for both discourse around your discipline’s approaches and methods as well as tensions between areas of expertise. It is helpful for students to be exposed to those conversations: it helps them not be siloed within their major and it reflects how they might serve on diverse teams in their career.

Interdisciplinary teaching comes with bureaucratic and logistical challenges for instructors. It’s important to engage your department leadership (chair, dean, ADTL) around the creation of a new course. Financial support and released time for new courses by units under resource constraints can be a challenge.
Studios courses are interdisciplinary

- Early Spartan Studios prototypes were taught as overload and supported by a stipend.
- For sustainable courses, investigate whether a special topics course can be allocated as a co-taught experiential course with faculty and students from other majors.
- Another option is the “bring your own students” model where each instructor teaches a course from their own teaching appointment (with its own course code) and brings students from that discipline into the collaborative course (see “Attracting Students to the Course” in Planning).

Studies by the Spartan Studios project and other universities offering similar courses describe beneficial outcomes for students and faculty that might help motivate administrators (Section of the Appendix).
Select your instructor team

Think about the faculty members or other disciplines that would be a good fit for the course you have in mind. Courses with 2-4 faculty work best.

What skills or learning goals could other disciplines bring to the table?

THINK BROADLY
Real-life challenges and wicked problems are multifaceted and can benefit from solutions incorporating communication, marketing, packaging, natural, social, or applied sciences, humanities, etc.
Set, share, and examine expectations

As you plan your course, discuss your expectations around workflow and shared responsibilities both around and within your teaching time. Be explicit and transparent with each other about your estimated availability for the course, as well as your expectations for classroom management, responsibilities for particular topics, and managing external partnerships.

This can be codified in a co-teaching agreement or remain informal; either way, be sure to avoid making assumptions about teammates’ expectations that can lead to misunderstandings later in the course.
Meet regularly with your teaching partners

(Both before and during the course) - It’s especially important to touch base throughout the course’s run to make adjustments based on how things are going. We call this meeting a scrum (originating in rugby, and also by teams in fields like software development). You can discuss upcoming needs, reflect on the past week’s events, and assign tasks. A short regular meeting helps you surface issues and make concrete plans better than emails back and forth.
Co-Teaching

Consider the identities of your co-instructors and students

Think about the different axes of diversity in the classroom: diversity across student backgrounds and cultural experiences and diversity across disciplines.
Hub scrum template with prompt questions for weekly reflection and planning.

MSU’s Center for Interdisciplinarity (C4I) is a resource for interdisciplinary research and teaching.
GORP
for high impact experiential teaching
High Impact Practices (HIPs) in a classroom are really important to overall student success efforts, so it’s important for instructors to be familiar with how to teach them. But faculty train to be researchers, mostly, so they aren’t always comfortable taking on complex teaching right away.

The set of approaches in the GORP framework amount to a rearrangement of several well known high-impact practices including interdisciplinary learning, collaborative/group work, project based learning, and experiential learning.

To help faculty engage in these practices, we observed and modeled student and instructor experiences to create a framework to guide teaching, reflection, and student assessment.

GORP:
Gravity, Ownership, Relationship, and Place
The GORP Framework

Earlier phases of the Studios project developed a framework for experiential learning with the acronym GORP: Gravity, Ownership, Relationship, and Place (Heinrich, Lauren, & Logan, under review).

The GORP framework is a key aspect of how we have designed Studios courses. We have seen how its 4 elements can lead to transformational learning experiences for students in Studios courses. (Heinrich et al. 2021).

We encourage you to consider how the following 4 elements of the framework might fit in your own experiential course. They aren’t all-or-nothing, and course instructors can decide in what ways to incorporate them into your course design.

Sidenote

The acronym GORP stands for “good ol’ raisins and peanuts” and emerged from one of the researchers’ background in outdoor education.
Gravity

Give students a challenge or opportunity that matters to them and they’ll be motivated. The primary motivator for student work in a traditional course is usually the assessment or grade. By organizing your experiential course around a significant challenge, a wicked problem, or an opportunity for students to meaningfully participate in or affect their world, you can offer students an alternative motivator: making a difference to communities affected by these challenges.

A course description that includes this gravity can help attract students who are passionate about that issue. Keep gravity central as you design your course and students’ interactions with community partners.

A holistic approach to grading, where students are assessed on their overall participation, processes, and reflections about their experience, helps to prevent the course grade from reasserting itself as the gravity. In other words, shift the point of gravity for students away from the grade.
Ownership

Give students autonomy throughout the experiential course, from the design of their projects through their implementation. Let them manage their teams and be accountable to each other for their work. Having this ownership motivates high levels of engagement with the course material and assignments and increases participation. In a course with high ownership, students see themselves as creators and contributors to real conversations with the course’s local partners. This could even extend to giving students autonomy over elements of your course design.

TIP

Be flexible about the kinds of projects that are within the scope of the course. Let students pivot their approach based on their new ideas.

Include opportunities for emergent outcomes that aren’t predetermined in the course design and for students to steer the instruction.
Experiential courses give instructors the opportunity to reset the traditional teacher-student relationship. Be a coach in addition to a lecturer. You can support students’ work on their teams and be a resource for them as they solve problems that emerge during their work. Learn from the students outside your discipline, and encourage students to learn from each other. By removing yourself as the gatekeeper of acceptable solutions, you empower students to learn from their choices.

These reconfigured relationships require trust within student teams, within the team of co-instructors, and between students and faculty. And although instructors ultimately do have power over students’ evaluations, try to avoid sudden reassertions of that power which can undermine student ownership and trust.
**Relationship:**

Students (and faculty!) may be uncomfortable at first with such a dramatic shift in agency; you should be explicit that this will be a different kind of learning experience.

We suggest making reflection on the new relationships part of your classroom culture. Instructors should be empowered to facilitate student-driven learning while also providing the benefits of their expertise, knowledge, and judgement.

We offer more advice and examples in [Planning](#) and [Coaching](#) below.
Place

Studios courses connect to local needs or partners in specific places, you can focus your teaching on those places and connect them to students’ work.

These places can be elsewhere on campus, in the local community, or even abroad. Visit it if you can (physically or virtually), and have students experience and reflect on their time outside the classroom. Places resonate, even if they can’t visit in-person. Encourage students to form their own connections with the place: What does it mean to them or to the community impacted by the course’s challenge?

Also, think about your teaching space. Early Studios courses were held in a flex space, a room with moveable furniture and whiteboard walls that students could reconfigure based on their teams’ needs. A flexible and collaborative mindset open to new and radical student-driven possibilities is part of the conceptual space we want to build in these courses.

Looking for outdoor space? Check out the Cory Marsh Ecological Research Center (CMERC).

This flexibility and connection is also possible in virtual classrooms and workspaces. Consider the affordances of both physical and virtual spaces that can enhance your students’ experience.
Teaching a Studios course requires more coordination with co-instructors and/or external partners than standard undergraduate courses. It’s important to begin planning your course early and take this planning seriously in order for your course to be successful.

During the planning phase, you will be selecting a course theme, choosing the right challenges for your students, developing your syllabus and learning objectives, thinking about recruiting students, and deciding on your course structure.
Course Theme

Form your class around a theme or challenge that is difficult to solve and benefits from many disciplinary perspectives. The topic or project you already have for your course might already relate to a wicked problem; you may just need to make that explicit by iteratively asking yourself why that topic matters.

For example:

**Course goals:** Students will reduce their own food waste and maintain an anaerobic digester to generate energy from food waste

**Why?** Because we need to communicate and share solutions for food waste

**Why?** Because food waste is a massive worldwide problem
Defining the challenge

The course topic needs to be significant enough for students to create a meaningful connection to the project (develop passion and drive outside of obtaining a grade, or the “Gravity”), while still being focused enough for students to make progress on their projects within the time and resource confines of a semester course. Striking this balance is important for students to feel connected to the project while also feeling empowered to make a tangible difference.

Students should have the agency to shape what their solutions to these problems look like, but you’ll need your judgement to balance between the course’s gravity and the depth of focus on these problems.

Ask yourself “what project goals will matter to my students and our partners but be achievable in one semester?” Ultimately, your students’ deliverables (what they create in the course, which can range from a plan, a prototype, or a finished product) will depend on the mix of specific students and majors who show up for the class.
Defining the challenge

Too broad

• worldwide food waste (too intractable and disputed)

Too narrow

• students’ personal food waste is too high (not enough impact)
• campus is not aware of MSU’s anaerobic digester (pre-existing solution)

“Just right”

• food waste on MSU’s campus (increase awareness and track campaign’s success)
• food waste at a grocery store (partner with a local business)
• food waste at the individual level within our community (partner with the municipal government)
Future potential

Consider a course theme with the potential for repeat offerings. The local solutions produced by the class one semester can be built on in the following semesters, or you can emphasize different facets of the problem each semester.

Think about how to maintain community partnerships for those longer-term projects (see “Partnerships” section).

Consider roles for students interested in continuing to participate in the course; for example, by returning as learning assistants to mentor teams of enrolled students, or encouraging local partnerships to create internships or job opportunities.
Attracting students to the course

Recruiting students to a new course is a challenge. Incorporate and prioritize your recruitment strategies as early as possible in your course planning.

If your course will be co-listed in multiple departments, one model for a Studio is “bring your own students”: each faculty member promotes the course in their department and “brings” their own set of students (for example, 4 instructors each bring 15 students from their own discipline). This works for classes where a larger number of students still fits the scope of the project(s).

Another option is to use interdepartmental listings. Any potential to list as a general education requirement (IAH, ISB, ISS) should be taken advantage of, as you can reach a larger pool of interested students. Be aware that obtaining approval for a new gen ed requirement can take up to a year.
Connect with Advisors

Advisors of participating departments/majors should be made aware of the course offering and can be valuable assets in advertising the course.

A compelling course description and interesting project are important draw factors as well.

Ask your advisors to share the course description with the campus-wide advisor network to reach interested students in other departments.
Create Learning Objectives

Consider whether these will be uniform or vary for students in different majors, and what goals the disciplines may share together.

Learning objectives can be explicitly flexible (i.e. gain a skill specific to your own career goals). Other learning objectives can relate to working on interdisciplinary teams or manage relationships with community partners.

Experiential courses can include content learning objectives; if these are uniform, they should be achievable by all students, regardless of their major.
Bloom’s Taxonomy

Bloom’s taxonomy is a well-known framework for describing educational goals. It’s a great resource for writing learning objectives.

- **Create**
  - Produce new or original work
    - Design, assemble, construct, conjecture, develop, author, investigate
  - Justify a stand or decision
    - Appraise, argue, defend, judge, select, support, value, critique, weigh
  - Draw connections among ideas
    - Differentiate, organize, relate, compare, contrast, distinguish, examine, experiment, question, test
  - Use information in new situations
    - Execute, implement, solve, use, demonstrate, interpret, operate, schedule, sketch
  - Explain ideas or concepts
    - Classify, describe, discuss, explain, identify, locate, recognize, report, select, translate
  - Recall facts and basic concepts
    - Define, duplicate, list, memorize, repeat, state

Credit: Vanderbilt University Center for Teaching
Planning Iterative Sprints

Project-based learning benefits from phases of iterative design. One model for Studios courses, described in (Heinrich et al. 2020) is to divide the semester into a content delivery phase followed by applied project work broken up into iterative production weeks, known as sprints, with student reflections. At each completed phase of the sprint, student teams present their prototypes and receive feedback from classmates, instructors, and/or community partners.
Course schedule template for Spartan Studios courses including orientation (burn-in), project training, sequential sprints, and final reflection phases. You can modify this schedule to fit your own course goals.

**Example:**

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<tr>
<th>Weeks 1-4</th>
<th>Week 5</th>
<th>Weeks 6-8</th>
<th>Weeks 9-11</th>
<th>Weeks 12-14</th>
<th>Week 15</th>
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<tr>
<td>Orientation content delivery (burn-in)</td>
<td>How to run a project in project-based learning</td>
<td>Sprint 1: Project plan, execution, reflection</td>
<td>Sprint 2: Apply lessons to project, execution, reflection</td>
<td>Sprint 3: Apply lessons to project, execution, reflection</td>
<td>Submit final project, reflect on course experience</td>
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**Blank Template:**

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Setting course expectations for students should start at the course listing/department advising and continue with the syllabus, the first few class periods, and periodically throughout the course. The experiential framework of the course and the method of assessment may be jarring for students—they have been trained in traditional education styles for nearly their entire lives.

- Mention in the course description that this is an experiential course.
- Clearly explain the experiential approach and assessment style to your students.
Consider an online Studios experience

Think about how these in-person, collaborative experiences can be translated into an online format. We have supported one online Studios course so far, which included synchronous sessions and independent student work.

Students can benefit from work on interdisciplinary experiential projects regardless of the modality in which the course is delivered; additional work is required to design what student-faculty and student-student engagements look like for an online course.

Resources from ASPIRE, MSU’s self-paced asynchronous professional development for online teaching.

Online platforms can facilitate student brainstorming. Students can contribute to collaborative documents (Google Docs), slides (Google Slides) or whiteboards (i.e. Mural or Jamboard). These and other tools can support student teams’ virtual design processes and work sessions can be visible to faculty in real-time.
Partnerships

SUMMARY

Community or industry partnerships can make Studios courses' themes and topics real and compelling for students and reinforce a sense of place-based learning. Based on the theme of your course, you likely have relevant partners in mind already.

Benefits to your students aren’t enough, however: to be a worthwhile partnership, your course needs to help your community partner, fit into their broader plans, incorporate their needs and expertise on the course topic, and maintain or improve the pre-existing relationships between the partner and MSU.

In other words, work with your community partners so that there are mutual benefits for you, your students, and your partners.

PARTNERSHIP OPTIONS

- Nonprofit organizations
- Community groups
- Local businesses
- Government agencies
- Existing university relationships
- Collaborations between universities
Center for Community-Engaged Learning

MSU’s Center for Community-Engaged Learning (CCEL) is the campus unit best equipped to advise you about finding and working with a local community partner in nonprofit or community groups. They have guiding principles and best practices for community-engaged learning.

Partnership options can include:

- Nonprofit organizations
- Community groups
- Local businesses
- Government agencies
- Existing university relationships
- Collaborations between universities

Examples

- the East Lansing library
- the Rachana Rajendra Neotropical Migrant Bird Sanctuary
- the Detroit Zoo
- the Pakwach, Uganda community
- the Food Bank Council of Michigan
- MSU's Student Organic Farm
Support partnerships

Be a supportive coach as your students work with external partners, as this might be very different from their traditional classroom experiences. Work with your students so they are prepared, professional, and empathetic in their partner interactions. Offer opportunities for your students to digest and reflect on their work with partners.
COACHING
Coaching

Students need opportunities to try new things and to not be afraid of taking risks or making mistakes, as we introduced in the “Relationships” section of the GORP model. To encourage this, spend more of your energy being their coach and less time in the role of their instructor. Be a partner in their learning. This involves supporting their work and giving advice, but not jumping in to solve their problems.

Be strategic about when to intervene if things do go wrong. They need to trust that they won’t be penalized for failure; encourage students to learn and try new things. Focus on their planning, progress, teamwork, and reflection.
Flatten your learning environment

Students bring valuable skills and knowledge to the classroom. Physically sit with them at their level - not standing above them or “sage on the stage.”

Learn from and with the students: admit knowledge gaps and allow students to fill them, and emulate a professional working relationship with them. Students may not be accustomed to being treated as your partner.

Show students that they have control over their work by giving them options within the course structure, asking questions instead of giving answers, openly acknowledging when they own the problem space, and modeling professional discourse within the faculty team.
Coaching Student Teams

Consider evidence-based team creation
• Build teams around projects or sub-projects
• Create interdisciplinary student teams, made up of students from different academic backgrounds/majors/departments

A personality quiz can be offered to gauge student personality types in terms of how they behave as a part of a team, work/leadership styles, etc. Examples include https://superpowers.sypartners.com or https://www.mint-hr.com/smalley-trent.html
Help teams manage themselves

Support teams in managing their own work processes and relationships. Judge when to leave students to solve their own team conflicts instead of stepping in. For example, if a student team is having difficulty focusing and making progress, a faculty coach sits down with the entire team and encourages an honest conversation about why the team thinks this is; encourage them to think of solutions to this problem. Facilitate discussion on how students can solve their problem within a team, rather than disciplining students yourself or insisting on a solution.

- Help teams avoid falling into traditional hierarchies or uneven power structures within their teams (eg. Are women expected to take notes? Who leads or speaks for the team?)

Example of gendered task division in physics lab courses and its effects
Coaching Student Teams

Promote the value of diversity

Ensure teams are aware of and actively appreciate the value of diverse perspectives.

- Facilitate teams’ acknowledging the intersectional identities of group members and leverage these intersections when creating strategies of work and developing solutions to the problems each team works on.

- Prompt the students to consider all perspectives and intersections of society that are affected by the problems they are working on, and reinforce this throughout the course. Wicked problems are multifaceted and often affect many different groups of people in different ways. Effective designs for solutions to these problems depend on understanding the needs of diverse audiences and users who will be interacting with those solutions.

These Inclusive Teaching Strategies from Yale’s Poorvu Center for Teaching and Learning can support your own development as an educator creating inclusive learning environments. There are more resources for diversity, equity, and inclusion in experiential courses in our appendix.
There are many options for assessment in your experiential course. In addition to assessing performance or content retention, you have the option to assess students’ holistic contribution, as well as to focus on engagement with the experiential process.
Assessing Student Work

- Consider holistic and/or assignment level assessment. Will you be more focused on a holistic assessment, meaning their overall contribution and engagement with the course? There may be specific components of the course where assignment-level assessment is a better fit, e.g., evaluating deliverables, specific performance, or content retention/mastery.

- You can assess team deliverables based on a rubric evaluating levels of quality with explicit descriptions for work that fails to meet, meets, or exceeds expectations.

- Assessment should reflect both an opportunity for students to demonstrate mastery of knowledge as well as their ability to apply what they know to a novel environment/challenge. Some assessment methods capture intended learning outcomes; other methods should be designed to capture emergent learning outcomes.

- Whatever your choice of assessment, be upfront and transparent with your students about expectations. Keep feedback central; a focus on grades can interrupt student ownership, while a focus on feedback reinforces relationships and students’ sense of ownership.
Assessment as Learning

In addition to assessment towards their grade, experiential courses offer opportunities for instructors and students to learn from the course processes and from each other.

- How do students charge forward in a project and stumble into/respond to barriers?
- How can faculty follow student work, prototypes, collaborations, and goals with their expertise to coach students to their next sprint?
- Assessment of your own coaching: are you modeling the role shift you want to see in students?
- Focus on feedback-rich classroom practices and formative assessment.

QUESTION

If you want student groups to give good feedback to each other, are you demonstrating good feedback practices with other faculty in public so students can see how to do it?
Evaluate Process and Reflection

Give students the opportunity to reflect on their progress a few times during the project. Reflection leads to metacognitive moments, where students think about their own thinking, creates opportunities for deep learning, and can be transformative. This also helps you understand team dynamics and how students assigned work within their teams. Reflections can be written or more open-format, like art projects. Reflection prompts can be specific to your course as well as more general prompts about their learning experiences.

TIP
You can use reflections to:
- evaluate project progress and topical knowledge
- evaluate team communication
- evaluate use of feedback
- evaluate how individuals learn their way through challenges
- evaluate student identity exploration
Reflection: PhotoVoice

PhotoVoice is a well-documented visual reflection tool used in qualitative participatory community-based research projects. MSU’s University Outreach and Engagement (engage@msu.edu) offers workshops about PhotoVoice. Here are some PhotoVoice resources including a PhotoVoice manual, a facilitator toolkit, an implementation guide, and an organizer’s manual.
Reflection: Sample prompt questions

- What strengths do you bring to your team? Are you using the strengths you anticipated using, or are new/different capabilities emerging as you work on your events?

- What do you most appreciate about some of the other students in the course? Rather than naming names, identify characteristics, activities, behaviors, etc.

- Has the course changed the way you are thinking about your work in the future? In what ways?

- Are there things that you would change about the course? What suggestions would you make to the instructors for future classes?
RESEARCH
There are many potential approaches to research connected to teaching a Spartan Studios course. These include:

- Disciplinary research inspired by the course
- Novel methods, insights, theories, applications, or results inspired by activity in the course that fall within one instructor’s discipline. For example, a student team comes up with a new approach to solving a packaging problem. The packaging faculty member works with those students to write up and publish this innovation.
- Studying institutional or student success outcomes
- Education research on your pedagogical methods and processes
- Scholarship of Teaching and Learning (SoTL) or Disciplinary-Based Education Research (DBER) about student learning outcomes.
- Research into student teamwork (for example, by analyzing student communication networks)
- Research on partner or community impacts and outcomes
Make a research plan

Plan ahead with your team for the kinds of research you’re interested in pursuing. There may be relevant data to collect during the semester, including classroom observations, student interviews/surveys, or specific assignment designs. You will also need to obtain institutional approval as well as consent from students and/or external partners to include their data in your research.

+ TOOLS

- Office of Research & Innovation
  MSU’s Office of Research & Innovation has resources for faculty members to get started on a research project, involving undergraduate students in research projects, and more.

- The Hub
  The Hub for Innovation in Learning and Technology has been conducting research on several Studios courses and can share our experiences in that area.
For more information about any of this material or to find out how you can teach your own Spartan Studios course, contact the Hub for Innovation in Learning and Technology (hub@msu.edu). We offer yearly workshops on planning and pedagogy for Studios courses and can consult with any interested units or faculty members.
This appendix includes categories related to different elements of interdisciplinary, experiential teaching and course design, and includes what we hope are useful annotations.

Research from the Spartan Studios project


  This paper is an overview of the Spartan Studios project and our results for students and faculty who ran prototype courses. It outlines the GORP model as well as the benefits and challenges of this approach to teaching and course planning.


  This paper [under review] describes the first iteration of what became the Studios pattern at MSU and introduces the GORP framework.

Research from the James Madison University X-Labs, our colleagues in Virginia working in a similar course model


  This report describes some communication strategies within the X-Labs’ drones course, how students documented and presented their works and how faculty plan to iterate the course.


  Describes an X-Labs multidisciplinary course on medical innovations and its assessment using qualitative content analysis about students’ attitudes and perceptions of different occupations.
Appendix: Annotated Relevant Scholarship


  A descriptive case study of the academic maker space in the JMU X-Labs, both describing specific courses and how X-Labs is administered. Offers this model as applicable elsewhere in higher ed.


  Describes cross-disciplinary courses as promoting entrepreneurship and innovation, by looking at startups coming from these courses. Offers a framework based on multidisciplinary problem-solving, Design Thinking approaches, and a lean startup methodology.


  A rebuttal to an argument that higher ed’s emphasis on innovation is misguided. Argues that innovation has positive student outcomes, is different from entrepreneurship, and that their interventions are effective.


  Describes the X-Labs as evidence for uncoupling entrepreneurship and innovation, and argues that conceptually they are separate; teaching innovation needs to precede teaching entrepreneurship


  Describes gains to ethical reasoning after the Medical Innovations X-Labs course.
Appendix: Annotated Relevant Scholarship


  Describes a case of the X-Labs autonomous vehicles course, its support of students’ technical and soft skills, and its reproducibility.


  Chronicle of Higher Education story about the JMU X-Labs course model.

Interdisciplinarity


  Offers a framework for thinking about different disciplinary connections, from disciplines being isolated/siloed from each other through transdisciplinarity.


  Evidence-based assessment of student learning outcomes and academic growth metrics as a result of participation in a first-year integrative learning community. The author outlines the interdisciplinary learning goals and processes of the program, and shows that students that participated in the program consistently outperformed students outside of the program in both short term and long term learning and academic growth benchmarks.
Appendix: Annotated Relevant Scholarship


  A review of expected benefits, learning outcomes, and processes (and potential roadblocks) of interdisciplinary education. Review applied to an interdisciplinary discussion based course. The authors claim that interdisciplinary learning can significantly contribute to intellectual maturity and cognitive development of students, and provide a framework of milestones that students may hit in the process of cognitive development through interdisciplinary ed.


  This magazine article argues for the benefits of interdisciplinary education for both students and institutions, and provides ways to encourage interdisciplinary education on a systemic level. The authors give key strategies and tips for facilitating interdisciplinary learning and creating student experiences. The barriers to interdisciplinary learning/education are recognized (specifically institutional) and potential solutions are given as well.


  Author argues that PBL is an effective strategy to facilitate interdisciplinary learning and vice versa. The author also acknowledges three barriers to effective interdisciplinary education: curriculum organization, student competencies to navigate interdisciplinary problems, and instructor competency - and proposes how to address these barriers.


Problem-Based Learning/Project-Based Learning


  While focused on problem based learning at the K-12 level, this paper covers topics relevant to higher education instruction, including implementation challenges, creating collaborative classroom culture, teachers adjusting to changing roles, scaffolding student learning, initiating student inquiry, maintaining student engagement, aiding conceptual integration, and promoting reflective thinking


  Study of student perceptions of problem-based learning in an anthropology course found that students with more subject matter experience didn’t necessarily have greater intrinsic motivation about the course. Also includes strategies for transitioning students to PBL when they are used to traditional lectures.


  A review of literature around project based learning that includes 76 papers. Topics covered in the review include cognitive outcomes of PjBL including knowledge and cognitive strategies, affective outcomes including perceptions of the benefits of PjBL and perceptions of the experience of PBL, and behavior outcomes including skills and engagement


  Study of instructors who implemented PjBL that focused around their challenges and successes with community partnerships, student engagement, and assessment
Appendix: Annotated Relevant Scholarship


_15 strategies for scaffolding learning and supporting students in PBL programs includes using a phased approach to PBL, getting student feedback in the first few weeks of the program, and develop learner’s reflective skills before self-assessment_


_Overview of student responses to problem based learning at an Australian university. Developed a continuum of how students react to problem based learning that includes missing the point, working in groups, splitting the workload, completing the task, assessing the task, learning new information, sharing ideas, and being self directed learners_


_While PjBL is often concerned with knowledge gain, this study suggests that PBL can also shift student attitudes around the topic. For this study, students designed a communications campaign for an office of sustainability. The students themselves were found to have more favorable views around sustainability by the end of the course_


_Brief overview of what project based learning is and four key steps to implementing it (defining the problem, generating ideas, prototyping solutions, and testing)_

Combines the results of many meta-analyses around PBL over the last few decades to compare PBL to traditional classroom learning. The study finds that PBL results in more satisfaction among students and faculty, leads to better long term retention of knowledge (traditional was better for short-term), and better skill development.


Two-year study of an interdisciplinary problem based learning task and student outcomes. Study used student feedback during each year to understand how students were feeling about the course. The instructors learned that students felt the instructors had inconsistent and unclear expectations and hence, experienced anxiety about grades. The instructors took this to mean that they needed to do a better job of articulating the learning outcomes and end of course goal. The instructors also learned that students often do not know how to collaborate interdisciplinary and decided to add scaffolding to the course.

Learning Objectives and Bloom’s Taxonomy


Overview of the original 6 levels of Bloom’s Taxonomy and the 6 levels of the Revised Taxonomy: remember, understand, apply, analyze, evaluate, and create. Includes the four types of knowledge: factual, conceptual, procedural, and metacognitive.


Strategies and tips for articulating and writing learning objectives including that learning objectives should be student-centered, break down the task and focus on specific cognitive processes, use action verbs, and be measurable.
Appendix: Annotated Relevant Scholarship


  Example of an interdisciplinary high school course (English & social studies) where the two instructors used a taxonomy table to map their learning objectives onto the 6 levels of the Revised Taxonomy and 4 types of knowledge. Such a table may be useful for thinking about the learning objectives in your course.


  An example of using Bloom’s Taxonomy in accounting ethics to create learning objectives. For each larger course theme, the authors list examples how learning objectives could be created from each level of the Taxonomy.


  Includes 19 processes/action verbs, how they map to the 6 levels of the Revised Taxonomy, and simple examples of what a task for students to do might look like. Examples of included verbs are “compare,” “implement,” “organize,” “critique,” and “generate.”

- Tyran, C. K. (2010). Designing the spreadsheet-based decision support systems course: an application of Bloom’s taxonomy. Journal of Business Research, 63(2), 207-216. [https://doi.org/10.1016/j.jbusres.2009.03.009](https://doi.org/10.1016/j.jbusres.2009.03.009)

  An example of using Bloom’s taxonomy to map course activities to ensure students have the prerequisite knowledge to complete the assignments.
**Reflection: Reflection as Assessment**

  
  *Introduces characteristics of critical reflection and the DEAL model.*

  
  *Argues that successful reflection is continuous, challenging, connected, and contextualized.*

  
  *Especially chapter 10, Using Assessment for Reflection and Self-Regulation*


  *Sees coupled reflection and assessment as mutually informing and reinforcing for students in service learning. Describes tools to guide reflective writing processes. Focus on both individual student learning and reflection as part of program-wide approaches to reflection.*

**Assessment of Experiential Education & Interdisciplinary Learning**


  *A summary of the research of the Evaluation of Experiential Learning project which sought to (1) assess the impact of experiential learning on secondary school students and (2) use that data to identify the elements of the EE programs that contributed the most to such student development.*
Appendix: Annotated Relevant Scholarship

  
  *In-depth discussion of assessment techniques for interdisciplinary study in higher education*

  
  *Implications of critical thinking coupled with engaged citizenry within experiential education courses.*

  
  *Introduction of a framework for targeted assessment of interdisciplinary student work. Also a good review of relevant literature of assessment and interdisciplinary learning in higher education.*

  
  *Exploration of experiential assessment within a Canadian University.*

  *Exploration intended for the use in identifying common methods and facilitating development of best assessment practices for higher education, specifically experiential higher education.*

  
  *Development and validation of an assessment which measured the understanding of the carbon cycle for high school and undergraduate students.*
Appendix: Annotated Relevant Scholarship

Building and Managing Student Teams & Team Dynamics

Online Experiential Education and Innovative Online Teaching & Course Structures


  Provides insights on how to implement an experiential learning framework into an already developed online course.


  Provides insight on how experiential learning can occur in an online format which acknowledges the new normal due to the COVID-19 pandemic. This includes case studies.

• Sharoff, L. (2019). Creative and innovative online teaching strategies: Facilitation for active participation. The Journal of Educators Online, 16. [https://doi.org/10.9743/jeo.2019.16.2.9](https://doi.org/10.9743/jeo.2019.16.2.9)

  Piece on how to keep students thoughtfully engaged with online courses.

Diversity, Equity, and Inclusion

• Bricklemyer, J. (2019, April 29). DEI online course supplemental checklist. [https://codl.ku.edu/sites/codl.ku.edu/files/docs/DEI%20Online%20Course%20Supplemental%20Checklist%202019Apr19.pdf](https://codl.ku.edu/sites/codl.ku.edu/files/docs/DEI%20Online%20Course%20Supplemental%20Checklist%202019Apr19.pdf)

  A set of five principles around designing a course for inclusion geared specifically toward online courses. Also includes links to other resources for more in-depth resources

• Canning, E. A., Muenks, K., Green, D. J., & Murphy, M. C. (2019). STEM faculty who believe ability is fixed have larger racial achievement gaps and inspire less student motivation in their classes. Science Advances, 5(2). [https://doi.org/10.1126/sciadv.aau4734](https://doi.org/10.1126/sciadv.aau4734)

  Students in classes where the instructor believed that student potential was fixed earned lower grades than in courses where the instructor believed student potential changed over time. In addition, the difference in grades between students from underrepresented racial groups and white/Asian students was larger in the classes with instructors who thought mindset was fixed.
Appendix: Annotated Relevant Scholarship

  A set of broad guidelines for ensuring that all learners can engage in learning, regardless of culture, language, or disability status. Each guideline includes practical examples of how it could be implemented in a course and the research supporting the guideline.

  Guide that covers why instructors need to develop self-awareness and empathy for students and consider classroom climate before pedagogical choices for inclusivity. Also includes an interactive webpage about inclusive teaching with literature citations and a checklist for instructors.

  A guide about personal pronouns and best practices for using them: include your pronouns when introducing yourself, avoid using “preferred” in front of pronouns, and using “go by” instead of “uses” when introducing pronouns. E.g. My name is Sparty and I go by him/his pronouns.

• University of Michigan Center for Research on Learning and Teaching. Inclusive Strategies Reflection. https://docs.google.com/document/d/1UK3HFQv-3qMDNjyt0fFPbts38ApOL7ghpPE0iSYJ1Z8/edit?usp=sharing
  A self-reflection tool for instructors about their teaching practices measured along five dimensions: critical engagement of difference, academic belonging, transparency, structured interactions, and flexibility. Each dimension includes ideas for instructors to add to their own courses

  Includes 9 recommendations instructors can take to create a more inclusive classroom including incorporating diversity into the curriculum, examining implicit biases, adding a diversity statement to the syllabus, and soliciting student feedback

Spartan Studios Playkit
Go • Create • Experiment • Partner • Design • Iterate

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MICHIGAN STATE UNIVERSITY