

Final Report of the College Experiential Learning Initiatives Committee

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Introduction

The undergraduate learning experience is changing profoundly, and the role expected of undergraduate institutions is evolving quickly. Students want their college experience to involve learning and doing so that they understand how information learned in the classroom or online can help them improve and better understand the real world. They want to make a difference. And, they want these experiences to begin early so they can carry a sense of purpose and connection through their whole undergraduate career. If done right, these kinds of experiential learning opportunities broaden students' career perspectives, help them hone a sense of their unique capabilities and place in the world, and prepare them for effective contributions in their future careers and, perhaps more importantly for this generation, in the world.

The University of Rochester is a leader in offering experiential learning opportunities that help achieve these goals and enrich the undergraduate experience. As a relatively small and research-intensive institution, the UR offers students an array of mentored research experiences through our Independent Study and Independent Research courses. Student involvement in these research activities has surged in recent years and further growth is expected as a result of our recently launched Research Innovation Grants. Additionally, the University offers a variety of other experiential learning opportunities for students. For instance, project-oriented capstone experiences are now part of several programs within the College, most notably within the School of Engineering. The Kaufmann Entrepreneurial Year allows students to connect their academic interests to the development of entrepreneurial projects that impact the UR academic community or external organizations. Student internships, in summer or abroad, can involve research or community service projects. The MicroBaja and Solar Splash engineering design competition permits engineering students to work on a co-curricular project team in development of an entry into the annual national competition.

Yet, according to the UR Senior Survey and Interviews conducted in 2012, UR undergraduates seek even more types of opportunities to connect classroom learning with

practice. And for those opportunities that are available, students note that it can be difficult to either find existing opportunities or to gain academic credit for them. Many also note that they feel little encouragement from faculty to pursue experiential learning opportunities. At the same time, faculty are uncertain of the role that undergraduates can play in furthering their research, and feel that their role as research mentors outside the classroom is not well-supported or recognized.

We would like to create a new model for UR undergraduate education where students at all levels move seamlessly from academic courses to co-curricular experiential learning projects, or meld the two in a fresh series of curricular experiential and project-oriented offerings. Our goal is to have students see experiential learning as a natural part of the residential college experience. This new Rochester experiential learning model would be unique in helping students choose experiences that engage them deeply in their major, yet also help them apply a multi-disciplinary perspective to their studies. Students would be able to find practice-driven opportunities to test what they know, and to reflect on that learning. Such opportunities will give students a sense of their unique value within the academic major, and increased confidence that they know how to make a significant impact in the world.

The committee for UG research recommends the introduction of several new initiatives in experiential learning as well as a substantial strengthening of our current offerings in Undergraduate Research, Scholarship and Creativity. Theme-organized experiential and curricular areas will be developed around which students can focus and connect diverse pieces of their academic and co-curricular experiences. Our long-term goal is to develop themes as dynamic and vibrant communities, with which students can engage throughout their time at the UR. In addition, current offerings in experiential learning, whether they be 39X courses, community learning opportunities, courses with substantial project-based learning, internships, or research abroad opportunities will be organized in a more coherent and visible way that emphasizes their role in building a student's "digital portfolio".

Section 1: Theme-based experiential learning

The committee recommends developing theme-organized experiential and curricular areas around which students can focus or connect the diverse pieces of their academic and co-curricular experiences while at UR. These themes would be faculty-driven, but in our vision would have the following key features:

- 1) Themes should highlight major yet broadly defined local, national or global challenges and/or explore fundamental ideas or concepts that transcend disciplinary boundaries.
- 2) Themes should tap into the interests of students while also being relevant to the research programs of faculty. This will allow faculty to shape any given theme at UR, and benefit from engaging with students on their research in and out of the classroom. Especially during the roll out of this initiative, it could be useful for themes to relate explicitly to current College initiatives, where there is support for new course and

research opportunities, and where projects or courses for freshman can be developed at a level appropriate to this group

3) Themes should be accessible to multiple disciplines. Especially, during the freshman seminar (see below), students will be encouraged to develop projects that take a multidisciplinary perspective. Students should learn how different disciplinary approaches can deepen their understanding of an issue or concept, as well as help find novel and effective solutions. Thus, where possible, themes should be chosen and organized so that each can be seen through several disciplinary lenses (humanities, social sciences, engineering, natural sciences).

4) Themes should help link existing courses and experiential learning opportunities, as well as encourage the development of new curricular and co-curricular activities that include substantial project-based learning. For example, themes should facilitate the development of a multidisciplinary freshman “gateway” seminar where students are introduced to multidisciplinary research methods and approaches, and begin working on theme-related projects.

5) Themes should encourage students to discover how their college experience can allow them to address problems of real significance, and also inform them of career paths that relate directly to their interests.

Several examples of broad, encompassing themes might include: Energy, Food, Sustainability, Music and Sound, or Mind. But it is important to note that UR faculty would play a major role in taking each theme and defining it to uniquely fit UR ASE.

We envision theme-organized work as a meta-educational structure where students can participate for 1 to 4 years in the theme, or move across several themes, making deeper contributions to the projects as they progress from freshman to senior years. We envision an experiential learning model that intentionally incorporates the many experiences in which students can participate and actively learn in an academic sense. Students would interact with a theme through many different vehicles: a new, two-semester freshman seminar (see below), new and existing courses that include project-based learning experiences linking to a theme, community-based learning experiences, 39X courses, senior capstones experiences, study abroad research experiences, etc. Thus, themes would have an extended lifetime, so that students and even alumni can stay connected to their progress over time. As new project themes come forward, older ones will be retired. We envision that 3 or 4 project themes can be supported each year. The following figure presents the curricular and co-curricular structure for each experiential learning theme. Note that in each instance, it will be crucial to closely connect experiential learning activities to a student’s academic development.

Upper Level and Capstone Courses Related to Theme	Themed Project "Space" Where students can pursue range of experiential learning projects related to theme for one term to 4 years Research Project teams Community service Study Abroad Internship
Junior Year	
Sophomore Year	
Freshman Year Students can take introductory freshman seminar, for cluster credit, related to theme	

D) Freshman Gateway experience

Students want to understand early how their time in college will help them make contributions to real world issues "larger than themselves." We want to jump start undergraduate involvement in experiential learning, transforming it into a core offering of the college curriculum: more self directed, intrinsically motivated and productive. It is hoped that early involvement in theme-based research and other experiential learning opportunities within and outside of the classroom will help students choose clusters or electives in a creative and productive manner, and see new relevance in the courses required by their major.

We are recommending a two-semester freshman seminar that will introduce students to experiential learning opportunities in the College (2 credit hours each). During the first semester faculty from a variety of disciplines will relay their academic journey in a way that introduces students to exciting examples of research/scholarship/creativity within different areas of the college. The goal is to acquaint students with how specific fields frame questions/hypotheses for research, the diverse methods of inquiry used across different disciplines, as well as how such investigations are embedded into traditional research and other practice-driven endeavors. Students would be introduced to what it means to be part of a research university, as well as become acquainted with the current university-wide experiential learning "themes". Emphasis will be placed on presenting these experiential learning opportunities as core features of an education here at Rochester, not just interesting extracurricular activities. Students also would meet with library staff to learn about available resources. In the latter portion of the semester, students would begin to work in groups with faculty preparing for their Spring semester project. Faculty would help students use what they have learned to frame questions related to a theme and think about how to implement a suitable project. This first semester offering would be optional and graded P/F, with attendance being the primary criterion for success.

During the second semester, continuing students would begin collaborative work on a project related to one of the ongoing themes. There would be several offerings, each focusing on one of the current themes. As noted earlier, the themes would be

approachable by several of our disciplinary divisions; engineering, humanities, social sciences, or natural sciences. Accordingly each of these freshman project seminars would be organized by at least 2 faculty, with the support of capable and experienced graduate students who could guide students in multidisciplinary projects related to a theme. We envision maybe 20-30 students in each seminar working in groups of 4-5. Faculty involvement would include a brief introduction to the scope of the theme, helping student teams develop a tractable project, and regularly monitoring their progress. This might mean meeting with the students weekly or biweekly to keep them on a productive path, and monitoring a blackboard-like website in which the students post their ongoing contributions to the group project.

We would encourage a broad view of what constitutes a suitable project for this first experience; posters, powerpoint presentations, debates, group-authored papers, websites, community projects could all work if they address the theme in an interesting and productive way. As themes develop a history, students will be encouraged to develop projects that complement earlier work. As described below, each theme will have a very visible and interactive presence on the web, where all work relating to a theme will be shared and commented on by the community. Work completed during this freshman seminar would be shared as well.

II) Integrating theme-based experiential learning model with current curriculum

It is hoped that some students will use a university-wide theme as a focal point around which they continue to structure their experiential learning. One of the key features of “themes” is that they will persist for long enough that students can revisit them through other offerings. Additionally, students may choose to move to another theme as their interests change and develop. As students move into their latter years, involvement with a theme would occur through other courses or clusters that have a project component linking to the theme, community learning opportunities, internships, senior capstones, research abroad opportunities, or traditional 39X courses. Faculty offering project-based courses should be encouraged to allow students to engage in ongoing university themes while fulfilling course requirements. In this way, students would be doing the kinds of things they normally do, but the overarching theme would make them part of a rich collaborative group. This model also creates the opportunity for younger students to benefit from and work with upper class students who have already spent some time on a theme-related project.

Themes could also enrich the existing cluster requirement. For instance, a theme could be developed as a cluster so that a student can take a series of related courses that address a theme. Students could complete cluster papers that allow them to connect cluster perspectives with some aspect of the global theme. This would create a new kind of cluster that supports students' active engagement in use of multidisciplinary perspectives on major issues and enables them to more fully engage in a true liberal arts education.

III) UR-specific resource for theme-based experiential learning curriculum, projects, activities

Our long-term goal is to develop themes as dynamic and vibrant communities. There would be visible and current presence on the web, as well as a team of core faculty to oversee each theme in its pilot year. The idea would be to develop and maintain an online social learning community in which prospective students can learn about what is happening within a theme, current students can learn from completed projects, and alumni can continue to follow progress on a theme in which they invested. The site would become the principal venue through which all contributions to a theme are catalogued and disseminated. However, the site would not be static, but would be focused toward supporting collaborative activities and networking of community participants. In its ideal form, it would also become a useful resource for community and global organizations /corporations tackling related issues.

Section 2: Improving access to experiential learning at the UR

One of the most widely used and successful offerings in experiential learning at the UR is our well-developed program of Independent Study and Independent Research courses. The opportunities offered by these 39x courses are tremendously diverse and include mentored research in a faculty's lab, teaching assistant experience, opportunities for individualized reading, scholarship and creativity, and formal shadowing experiences that inform students about possible career paths. Enrollment in these courses has always been robust, but has surged since 2008 when the office of Undergraduate Research was restructured and reinvigorated. Furthermore, survey data indicate that graduating students who did not pursue undergraduate research wish they had.

Given our relatively small size and our vibrant research community this program of 39x offerings is, and should remain a principle vehicle for experiential learning. But data from student surveys and faculty feedback suggest some important and realistic improvements in this program that could make it better, more accessible, and more cohesive. For instance, students want help in finding appropriate mentors who understand and can nurture the student's interests. Students want to begin their research experience earlier and there should be ways for them to begin thinking like researchers as soon as they arrive. And younger faculty need training in good mentorship, as well as appropriate incentives that signal the importance we place on this teaching method.

Below we outline two sets of recommendations aimed at increasing student and faculty participation in experiential learning at the UR

I) Improving access to undergraduate research

1) Improving the visibility and organization of UR experiential learning opportunities

a) There are a number of existing experiential learning experiences already available in ASE, and it makes sense to catalog them in an organized manner so that students can

more easily find them. For example, individually mentored research (e.g. 395 courses), select classroom experiences that involve substantial project-based learning components and/or fieldwork, select community learning opportunities, as well as senior capstone experiences all offer valuable experiential learning opportunities that enable students to apply classroom learning to real world problems.

Yet, students do not recognize that these various opportunities are all linked in their goal of providing students a way of applying what they learn. This could be remedied by bringing these various offerings together under a common organizational structure. We recommend that this organizational structure be used to create a web based, searchable listing for these “portfolio building” opportunities. This portal would make it easier for students to identify research mentors, make connections, and learn what PIs are looking for in undergraduate researchers.

We also recommend creating a Registrar Course Catalog course tag that identifies courses as including a significant experiential learning component. Applying such a tag would be accomplished through application to the College Curriculum Committee who would be provided with a set of review criteria to determine if a course may be assigned such a tag.

b) Students also need “local” knowledge and support as they first get involved in undergraduate research. Each Department or Program should have a designated faculty member who is knowledgeable and able to give advice to undergraduates seeking to do research with faculty members associated with that major. This responsibility might be a small extension of the responsibility of each Department’s undergraduate academic advisor, or it might be a newly designated position of responsibility within each major. In addition, the undergraduate peer-mentoring program (being run as a trial this year) should be expanded to encompass all the majors in the College. If possible, peer mentors should have done some undergraduate research/experiential learning in the past. Peer mentors should be trained by the local faculty, UGR advisor and the College Dir. of Undergraduate Research so they can give students specific and sound advice about seeking to do undergraduate research.

2) Early UGR research grant: In order to increase opportunities for younger students to become involved in undergraduate research we propose grants of \$3000 be made available competitively (5/yr) to support undergraduate research for students between the end of their freshman year and the end of their first semester sophomore year. The money may be used for pay, equipment, conference support, travel, etc. Initially, it may be useful to limit these grants to students applying that have taken the freshman research seminar described above. A faculty committee made up of members from each disciplinary area of the College could judge the proposals.

3) An UGR competitive grant program: A grant program where up to \$30,000/year is distributed through awards for competitive proposals. The student/mentor should make a reasonable case that this research cannot be supported completely via other means,

though some cost sharing would be welcome where possible. A faculty committee made up of members from each disciplinary area of the College would judge these proposals.

II) Increasing faculty support for undergraduate research mentoring

1) First-time mentor's grant: This is a grant of up to \$5000 provided to up to 5 faculty members (in College or Med Center) per year who apply for it to support undergraduate research (via pay, equipment, conference support, travel, etc.). Applicants must have never worked with undergraduates in research before. The program is publicized and run competitively. In addition, there could be some targeting of this award to faculty working with undergraduates in a particular area. The size of the award is large in order to tempt faculty who have not traditionally worked with undergraduates to consider seriously the possibility of doing so.

2) New junior faculty UGR grant: As part of the welcome to UR, new junior faculty in the College are provided with a one-time only grant of \$3000 that must be spent in support of undergraduate research. Spending of funds must be approved by a faculty committee or the Office of Undergraduate Research that tracks the expenditures and insures the money is spent in some way that is reasonably associated with undergraduate research. The funds must be spent within three years of the faculty member's arrival at UR. The purpose of this program is to encourage new faculty to become involved with undergraduates in research at the start of their careers.

3) A "Goergen-level" award for excellence in teaching through undergraduate research and experiential learning: This award given on roughly the same time-scale, with roughly the same prestige/money as a Goergen award. The process of nomination and selection is similar to Goergen. The aim of this award is to recognize significant contributions in this mode of teaching, thereby bringing attention to experiential learning at UR, showing that UR thinks it is important, and contributing toward others

Section 3: Barriers to curricular innovation

Introducing a theme-based experiential learning model, expanding undergraduate research, and creating project-based learning experiences in the classroom are obviously labor intensive from a faculty point of view. It is hard to imagine that rollout of these initiatives can be "faculty neutral". We see significant challenges in attracting the broad interest and support of faculty, and list some of the most significant barriers below.

1) Finding themes of interest to faculty: One potential problem is developing themes and project-based learning opportunities that can connect multiple disciplines. For instance, within the Humanities the types of broad-based [and socially relevant] themes towards which such a model gravitates – e.g., energy, food, sustainability, human aging – do not generally have much disciplinary traction. They may not, for the most part, tie into faculty's developed interests, as reflected in ongoing research and existing courses. Nor does the thematic approach necessarily reflect core research methodologies or the guiding principles around which humanities courses are structured. Second, it is not clear how

well the project-based model conforms to most humanities research, which, with some significant exceptions, remains individual, immersive, and single-authored rather than team-based, project-centered, or collaborative. In other words, disciplines may not share a common understanding of project-based learning.

Possible solution: The committee suggests development of three broad types of themes so that faculty from all ASE disciplines may participate:

--Major multidisciplinary global issues such as energy or food where faculty from across many disciplines may find interest in participating in or developing courses or projects related to this theme.

--Timeless issues that can be explored deeply and from a number of different perspectives (e.g. Time, Mind, Self, etc). These themes would allow faculty to develop courses or projects more closely related to their disciplinary methods of inquiry.

--Issues that link to strategic research areas for the University of Rochester or Arts, Sciences and Engineering such as digital media or big data where faculty can develop new research projects and courses for engaging students in these emerging research areas. In the process, faculty and undergraduates actively engage the university's strategic research goal.

Possible solution: Broadly and flexibly define what constitutes project-based or experiential learning so as to recognize the variety of scholarship and research approaches across disciplines. This would entail substantial "local" involvement in developing and vetting theme-based experiences.

2) Faculty incentives for participation in theme activities: Given that many departments and their faculty are currently working to solve the issue of heavy teaching loads that follow from increased undergraduate enrollment in majors and courses, providing faculty incentives and support to participate in theme activities is paramount. While such programs might be manageable for our smaller majors, it is unclear how they could be scaled up to our larger majors, ones that include hundreds of students (e.g., Biology, Economics). In particular, in our large majors it is very difficult to see how any teaching relief that results from online learning could begin to free up enough time or resources to oversee hundreds of experiential learning projects.

Possible solution: A review of teaching loads and Teaching Assistant budgets or assignments in departments with large undergraduate major or course enrollments or departments with significant enrollment in cluster courses should be completed. In this manner, faculty receptiveness to this report's education innovation recommendations will improve.

Possible solution: Begin the roll out as relatively small, faculty-driven pilots so that the theme based initiative can gain traction with departments, faculty, and students.

Possible solution: Review and revise the College guidelines for faculty promotions to make explicit the value placed on teaching through undergraduate research and project-based classes

Possible solution: Provide faculty teaching relief time and/or financial support needed to entice faculty into developing project-oriented courses and activities. With faculty relief time to teach new theme courses, the issue of which faculty will teach the current load of courses arises. Finding a balance between the teaching of old and new courses will need to be addressed. For instance, by providing additional staff to cover vacated courses when existing faculty are relieved to develop project-based courses or themes

Possible solution: Provost multidisciplinary awards and/or bridging fellowships for theme development would provide teaching relief for one semester and the possibility to request additional funds in order to support development of a theme and/or upper level experiences that would support theme-based experiential learning. Awards would be given based on the quality of the proposed idea, the degree to which it will facilitate experiential learning among our undergraduates, plausibility of success, degree of innovation, and the degree to which the proposal fosters interdisciplinary approaches to an issue. The deans in consultation with a faculty committee would make decisions.

Possible solution: The Dean's Education Technology Committee recommendations involve development of blended courses with particular focus on very high enrollment courses such as the introductory courses in math, biology, chemistry, physics, economics, psychology, political science, and economics. In these courses, the recommendations involve the development of online tools, such as lectures, short modules focused on particular disciplinary concepts, practice problems, supplemental learning materials such as labs or data sets for analysis that can together support faculty and Teaching Assistants in the teaching of large enrollment courses. While this solution may not necessarily lead to more faculty time for theme activities, it may make for a more efficient and effective teaching experience in these courses.

3) Academic credit for alternative course and experiential learning activities:
With most students' academic programs already locked into a heavy load of major and cluster requirements, the curricular "wobble room" for taking ambitious new project-based theme courses may be small. Moreover, academic policies limit student work outside of the classroom to a small set of permitted academic activities (eg. approved internships, study abroad courses). The recommendations for theme activities include a new type of multidisciplinary project-based course that may span several departments and, therefore, may not seem to fit current policies for student credit in a major or cluster. In addition, some new experiential learning activities may include service learning projects or study abroad projects only loosely tied to a formal course structure, but might be better described as a 39X type of independent study course.

Possible solution: The committee recommends that the ASE Curriculum Committee review consider adjusting course requirements to allow students to get credit for pursuing these courses as part of current or new clusters or as 39X equivalent academic opportunities. In this way, students could gain credit for certain experiences. Also, departments should be encouraged to consider or offer these types of experiences for upper level major credit.

Section 4: Administrative structure required for implementation

The potential complexity of coordinating or developing multidisciplinary experiential learning courses, projects tied to local service learning or study abroad projects, and education technology projects involving design and testing of course modules and other software presents significant challenges to the College administration and faculty. A productive and successful pilot development and rollout is essential. Our view is that the most effective way forward is to devise an administrative structure whereby key staff members work with project faculty and relevant units within the College who may be needed to support faculty in moving projects from pilot to full roll out. The key staff would also support and coordinate the process coordinating existing offerings with pilot projects and roll out. A new Dean's Education Innovation Initiative Advisory Board, with a faculty chair and administrative co-chair, would provide the oversight and executive management for ensuring the projects move from pilot to implementation with appropriate staff, budgets, and materials so that faculty work on new courses or projects is productive and student experience is positive even in pilot stage. Led by a strong faculty advisory board with oversight of project choice by both RFP and committee designation, the new center director would have the experience and responsibility to resource multiple, yet coordinated, projects with needed staff and budgets, and ensure appropriate collaborations from staff in other ASE units to work on Center projects as needed, as well as work with the board to seek major external grants or fund raising for unique curricular ideas. Some of the foreseeable issues that could be addressed by this administrative organization are listed below.

1) Our key goal is to make ASE undergraduate students view experiential learning in its many forms as a natural part of their education here from their first day on campus to the last, rather than as many see them now- as a set of extracurricular activities that parallel course work. The College has to take the same attitude. This means that, where possible, new and existing offerings in experiential learning should be viewed as either an alternative means of satisfying College graduation requirements or integrated within the existing structure of courses. This will require careful collaboration with the College Curriculum Committee to assess what types of experiential learning might be used to satisfy Cluster requirements, how Cluster requirements might be altered to permit Clusters to be completed within experiential learning themes, what upper level major requirements or senior seminars might be admitted to major requirements, etc.

2) Particularly for new initiatives such as theme-based experiential learning, there have to be clear guidelines for what constitutes an appropriate theme: scope, connection with faculty strength and research, links to community learning and study abroad, etc. A call to faculty is recommended- the call would lay out the above criteria for an experiential learning theme and would invite faculty to develop ideas for courses and activities that a theme chosen by faculty. In this manner, faculty with interest could step forward and engage the idea. Faculty would then, as needed, work with key staff and the faculty advisory board to vet, and further develop those themes with greatest promise

3) We will have to find and reward faculty eager to participate in these initiatives. Our view is that faculty should be supported and recognized for their involvement. Faculty need to be encouraged to develop theme-based offerings, take on undergraduate researchers, and strive for the same level of educational quality as is seen in our classroom offerings. Again faculty stakeholders and key staff would be in a perfect position to evaluate faculty proposals for support, as well as recommend awards for exceptional mentorship in experiential learning. We made several recommendations above concerning faculty summer salary or teaching time that would be of great value to faculty as incentives to participate, in addition to seed development budgets, as defined in proposals, that faculty would control for the projects.

4) Many of the ideas presented in these reports (e.g theme based web pages, digital portfolios, technology-enhanced course offerings, and online courses) will require faculty and students to use technology in novel and exciting ways. This will require ongoing and easily accessible support. We believe that faculty and staff working with IT, the library, and others will ensure that the right kind of support is provided and sustained.

5) The success of some activities chosen as part of an experiential learning theme may require student team work that, in turn, will require more student meeting space for groups to gather and do work. We should make clear that space planning does not lead, rather activity development shapes space planning. Hence, space requirements are generally not a necessary component of experiential learning in teams on a large scale until post pilot stages. This would provide the Deans with time needed to determine the needed space and budgets to support collaborative work spaces as pilots evolve.