

# Whose Idea Is It Anyway?: Students Communicating Innovative and Entrepreneurial Work and the Quagmire of Ownership at the University Level

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**Abstract - At many universities across the United States, the students' ideas resulting from course-associated work may not be their own, especially if they make "significant use" of university equipment or resources. But what does "significant use" mean for an undergraduate who is required to complete a unique design, in a team, for a grade? Is the design patentable? Licensable? Protected? The authors explore ramifications and ways to raise awareness for project-based designs and the communication of those designs.**

**Index Terms - Undergraduate engineering, design projects, public disclosure, intellectual property, patents, project-based learning, technology transfer, ownership, engineering communication, engineering presentations**

INTRODUCTION: A CONTEXT FOR UNDERGRADUATE, GRADUATE, AND FACULTY DESIGN WORK AND OWNERSHIP

When undergraduates embark upon a design project for a course assignment, instructors often frame the project as a "real" problem to be solved. They might pitch to the students that their ideas or designs could lead to a patent, an entrepreneurial endeavor, or a client-specific application. Doing so impresses upon students the idea of "real" engineering design for specific contexts, with specific constraints.

For example, Dr. Ron Ulseth, director of the Engineering Program at Iron Range Engineering, clearly identifies the projects for his students as being for-client projects that are "real," as they will be used by the companies partnering with the academic program. For students, the authentic task of designing something that is immediately useful or even patentable is an inspiration to do the work well, to do it ethically, and to meet specific client/partner expectations and constraints. They understand the possibility of patenting designs/inventions as a true motivating force in their ambitious engineering

design work [personal communication, March 30, 2016]. Everywhere, we hear of project-based learning, problem-based learning, service learning projects, and the like. The U.S. is developing an "invention- convention" mindset among students, starting as early as Kindergarten, with innovation camps and fairs, idea incubators, pitch contests, and federal dollars being pushed toward building a generation of students who invent things. The 2016 U.S. budget provides for more than \$3 billion in STEM education programs [1] and for "[i]nvesting in what works in K-12 and postsecondary education with \$300 million for Investing in Innovation [2].

These initiatives are compelling and bring the world into the classroom. In doing so, college and universities acknowledge the inventive work that students produce in many ways. And some ideas are so unique and visionary that they might need intellectual property protections. However, if instructors try to discover who owns a design or invention for their undergraduate students, specifically, it becomes complicated.

## *I. Graduate and faculty design work and university policy*

The relationships that universities and colleges have with their graduate student and faculty inventors are somewhat clear; therefore, we will look there first in order to create a context for undergraduate work. In our research, we found that most of the public-facing online statements by universities and colleges about design/invention ownership address graduate or faculty work; this is understandable because institutions have a far greater investment in time, energy, and resources in those individuals.

Understandably, universities and colleges are often careful to outline partnerships between faculty and outside organizations. Sometimes, the waters become murky when a university employee (faculty or graduate student) moves to the corporation that was sponsoring the research that the faculty or graduate student was working on at the university. While university policies are fairly

clear about research related to faculty and, as an extension, graduate students, recent cases illustrate the need for graduate students to understand how their research is situated within their advisor's or corporate sponsor's larger projects.

Lawsuits by former graduate students against their alma maters are being found in favor of universities. These cases serve as cautionary tales, not necessarily for the universities who seem to be winning, but for graduate students and faculty members who may not understand they are participating in something bigger than their own research, depending on who is sponsoring that research. One day soon, a lawsuit by a former graduate student may stick.

One such case is *Mark G. Charest v. President and Fellows of Harvard College and Andrew G. Myers (Charest v. Harvard)*. Mark Charest, PhD alleges that Harvard denied him royalties resulting from patents he worked on under the direction of Andrew G. Myers, PhD. [3]. The claims against Myers, have been dismissed because the statute of limitations has run, and the remaining issues revolve around Harvard's failure to follow its own procedures relating to intellectual property (IP) contracts [3]. The details of this case provide a worthwhile read and cautionary tale for graduate students who seem to be caught in the quagmire of policies written by university administrators, research sponsorship, and power wielded by research advisors. But, despite confusion at the graduate level, policies related to undergraduate research appear to be much more in flux.

## II. Undergraduate design work and university policy

Differences in intellectual property ownership policy related to undergraduates, specifically, are vast. As well, even course-by-course, the standard may be different within a university or college setting. However, by looking at a wide variety of statements from universities and colleges (big and small, public and private), we have identified some general trends in the ways that these institutions regard ownership of intellectual property, design/invention work, and the patent ownership concept as they pertain to undergraduate endeavors. We cite just a few herein.

First, generally speaking, many universities state that they will not make any claims on undergraduate work if it is the normal outcome of a course. See example statements from the Cornell Games Design Initiative [4] and Boise State University [5].

Second, if the undergraduates appear to have a design or invention that could be grown into a profit-making venture or patent, three main avenues appear open to them. We summarize those stances, below, with cites added so that you may peruse the original wording:

1. The university may want to be informed of the intellectual property via its IP offices, but it will not make claims. See that of MIT [6].

2. If the student/team has used funding from a special grant or body, then IP ownership could be claimed by the university. Example statements from Purdue [4], and University of Wisconsin-Madison [8].
3. The university can lay claim to patentable work done within its facilities, using its resources (including computers), during work hours or beyond [9].
4. If the student/team has performed design/invention work as part of an agreement with the university and an outside client, then that project-specific IP belongs to the client and/or university. Example from Iron Range Engineering (personal communication).

Of course, if you have any questions at all, it is best to gain advice and perspective from your university/college IP offices, as each state and institution may define these student situations differently. These relationships should be discussed with any outside or partnered clients, as well, including non-profit organizations.

## UNDERGRADUATE INTELLECTUAL PROPERTY, PUBLIC DISCLOSURE, AND THE PATENT CLOCK

As the instructor, if you have created an assignment that requires original design work from students (in a team or working alone), and if you have those students reveal that work with a presentation, then the concept of "public disclosure" has come into play. That work has now been made public (yes, even inside a small classroom) and if the students wish to patent the design (or other intellectual property), they have one year to do it if they plan to file in the United States. Let's unpack this situation a bit more for deeper understanding.

### I. Defining "public disclosure" for patent applications

In the simplest of terms, if any idea is communicated in a non-confidential setting, then that idea has been publicly disclosed [10 - USC 35, sect 102]. Once disclosed, the idea loses its safeguarded status of "novelty" needed to file a new patent. Methods of communication that fall into the definition of "public disclosure" include conference talks, class presentations, dissertations, printed (online or print) articles, open thesis defenses, poster sessions, seminars, webinars, blog posts, social media posts, for-sale items, and so forth [11]. Any communication of the idea without an expectation of privacy will be treated as a public disclosure of that idea by the USPTO<sup>1</sup>.

### II. Understanding "public disclosure" in the US

According to the USPTO and the US National Archives and Records Administration [12], if an invention or design is revealed via any public forum, the inventor has one year from that event to file a patent or lose the

opportunity to do so. In the US patent code [9], the framework for filing a new patent is covered. If the inventor has disclosed the idea, and if the inventor waits more than one year to file a patent, the idea may fall under “prior art” and not be eligible for patent protection. In 2011, because of the Leahy-Smith America Invents Act [10], this window of one year to file at the USPTO was enacted. Before 2011, the one-year grace period was not in effect.

However, along with the change of rules in 2011 came another provision: the First Inventor to File Provision; this allows anyone who witnessed the public disclosure of a new invention/design to file for a patent of that item at the USPTO before the inventor, and file with legitimacy [10, specifically USC 35, sect. 102b]. That patent, filed by another, could hinder chances for the original inventor to file with success. In other words, a witness to a student design project could “steal” that idea and file for its patent.

### *I. Understanding “public disclosure” beyond the US*

Unlike the United States, other nations around the world do not generally have the grace period of a year to file by the inventor. The World Intellectual Property Organization (WIPO), when discussing the confidentiality of a new invention, states that “any invention which is made public before an application is filed would be considered ‘prior art’”; the WIPO explains that revealing a patentable item in such a public manner would prevent a patent from being granted because the invention would then fail the novelty requirement [13]. The WIPO goes on to state that some countries allow a grace period of six to twelve months, which provides a bit of a safety net.

### *II. Understanding “public disclosure” and undergraduate classroom presentations*

As noted above, any public sharing of an original, patentable idea will start the clock on patent filing in the United States. Let’s focus on undergraduate classroom work, specifically.

Within the classroom, there may be a bit of a safety bubble assumed by teachers and students alike. In most cases, while it seems that the classroom is not a public forum, that is not guaranteed in many circumstances. Some simple safeguards could go a long way, however, in protecting students’ original ideas in the undergraduate classroom.

As a common way for students (individuals or teams) share projects, designs, and technical ideas is to give a classroom presentation. Generally speaking, this kind of presentation would be considered a public event.

However, there are some simple steps that can be taken to protect student work that may be patentable. For example, if students are giving a presentation about their invention or idea, if one of the slides states, “The information that you see is confidential. No information

in this talk should leave the room,” then that gesture would go a “good long way,” in securing the ability to patent. Another way to manage or lessen the chance of a patentable idea being compromised by audience members is to have them sign a non-disclosure agreement at the time of the talk. The students should keep that paperwork (not the instructor).

Nevertheless, whether these safeguards have been put into place or not for student talks, if the students reveal an idea or design that could be patented, the clock begins (in the United States), and they have one year to file. Remember, that rule does not apply in other countries uniformly; so if an audience member witnesses a talk and likes the idea, it may be immediately patentable in other parts of the world.<sup>1</sup>

### *III. Poster sessions also start the patent clock*

Because posters are usually available for a somewhat uncontrolled crowd of observers, it is safe to assume that any invention, idea, or design that is revealed via poster presentation would be considered publicly disclosed. In those situations, there is no reasonable assumption of privacy or security for the idea.

Such practice has precedent [12]. Thus, anyone (undergraduate or otherwise) who displays a poster at school, at a conference, or other open event can assume that the patent “clock” for US filing has begun.

#### UNDERGRADUATES AND VIDEO GAME DESIGN: THE SITUATION IS NOT QUITE SO CLEAR

When thinking of project-based learning for technical work, very often with think of engines, cars, assistive gear, and other tangible gizmos. However, we cannot forget the important work being done with coding, gaming, and other e-deliverables. Generally speaking, the advice of the past has been that new creative work in the form of a video or computer game, or online learning games, for example, cannot be patented. Some of us may remember the life-changing event called “Pong” around 1972 [14]. Following that patent grant, most (but not all) video game patents have centered on the specific technology or controller system that drives the game. That is, technical innovation and specific game technologies can be patented. Usually, video games of any sort that do rely on absolutely innovative technologies are re-inventions of themes and ideas, to some extent. Thus, they often cannot be patented or will see long litigation if filed. While it is possible to patent software, it is not an easy process, as of this writing.

However, instead of a patent, it is possible for copyright to be granted to the software code that helps to generate the game. A copyright for a game protects the expression of an idea—that is the look, appearance, pace, sounds, and etc., that make a game unique. For example, the recent breakthrough game “2048” by Gabriel Curilli

was built off of the original app by Veewo called “1024” [15]. Nevertheless, many copycat games have been built using the same combination-style of play, such as “Philosopher’s Stone” by StormBringer Studios [16]. Any of these might file for copyright protection.

If you have student teams, or individuals, who may have a game that could do well on the market, it is wise to help them seek out your campus’ intellectual property unit and get solid advice from those legal experts. Video games are a murky area, even to the USPTO.

#### HOW TO IDENTIFY CAMPUS RESOURCES AND POLICIES FOR IP SUPPORT

Instructors who have students create design ideas, who direct Honors, Masters, or Doctoral theses, who have students conduct research and present it in a classroom, at a research fair, or hang a poster in a hallway, need to understand how ideas are treated on their campus and how to help students protect their ideas.

Because policies differ from university to university, no one can provide a one-size-fits-all guide for managing ideas. University policies plus federal IP law create the auspices under which students, faculty, and researchers work on that specific campus. This section explains how to identify support across campus.

A quick Internet search would probably lead to a university’s IP rules; however, these rules are usually complex and vague. While instructors need to locate these

rules and read them, a better approach is to find the offices on campus that rely on and use these rules in practice. Personnel in these offices will understand the nuances and how to interpret university IP policies related to student work. Chances are that your university has availed itself of some of the billions of innovation dollars and has one of these offices on campus:

- Office of Research Oversight
- Technology transfer office, sometimes called the office of industrial cooperation or the patent protection office
- Campus Incubation Center
- Center for Undergraduate or Graduate Research

Off-campus programs also draw on federal, state, and private funds to provide the following services to inventors and start-ups:

- Business incubators
- Patent programs
- Business development organizations

While not every person with a new idea needs to seek a patent, business development organizations can help an inventor determine the best path to take.

On- and off-campus offices tend to be organized similarly to the offices shown in Figure 1, with the office responsible for research financial resources related to research taking the lead:

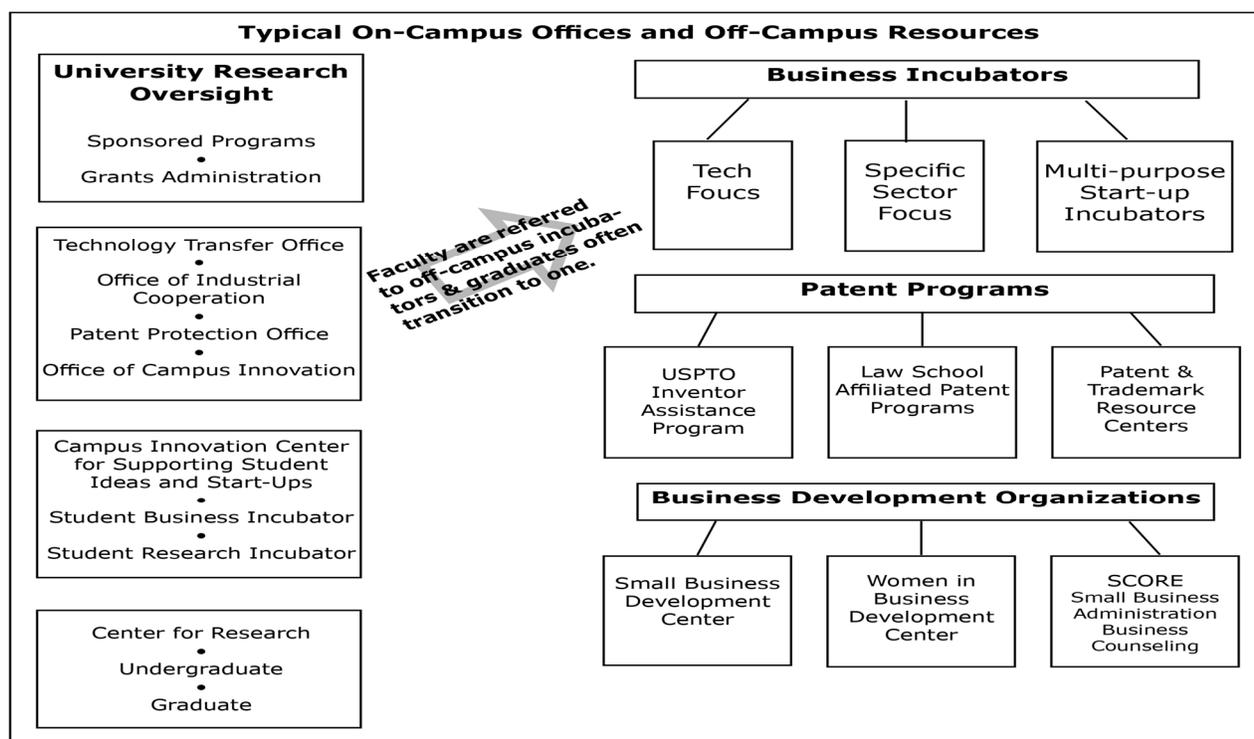


FIGURE 1. TYPICAL ON-CAMPUS OFFICES AND OFF-CAMPUS RESOURCES. SUCH OFFICES ARE AVAILABLE TO HELP PROTECT THE INTELLECTUAL PROPERTY OR DEVELOPING BUSINESS IDEAS FOR YOU AND/OR YOUR STUDENT.

### *I. Office of research oversight*

The office of research oversight tends to top organizational charts related to research and development on campus. This office oversees compliance with human subjects and animal research; manages external grant funding; and makes recommendations related to the research direction of the university. Most other offices on campus related to research fall under the jurisdiction of this office in some way.

### *II. Technology transfer office*

Coppola describes technology transfer as “the complex social process that moves technology from bench to market” [17, p. 285]. The technology transfer office strategizes with campus innovators about the best way to get their work into the marketplace. This office also provides education to professors whose students engage in design work or work that might lead to new ideas. On your campus, the technology transfer office might be called the Office of Industrial Cooperation, Patent Protection Office, or the Office of Innovation. If you are not sure, contact the office that manages federal grants and ask who manages the technology transfer process on campus.

### *III. Student innovation centers*

Campuses are developing business and research incubators for students. These labs sometimes have maker spaces available where students can print 3-D prototypes and use other tools. Student innovation centers offer free or low-cost services to registered students who are working on new ideas or business start-ups. Innovation centers connect students with ideas to professors or others who have expertise to help students develop their ideas. These incubators typically offer office space to for students with business start-ups so that they are not trying to hold business meetings or conference calls in their dorm rooms.

Campus innovation centers may be the best resource for faculty who need assistance with courses that result in projects that lead to novel ideas. These centers welcome faculty, and want faculty to visit the incubator and to learn more about how to help students develop new ideas. Staff members can provide information about campus intellectual property rules, what resources are available to students, and training for faculty and classes. Innovation centers are geared for understanding how student ideas and university policy work, so getting the innovation center involved in your course planning will result in your having the non-discrimination agreements, business counseling resources, and intellectual property knowledge that you need to protect students' ideas.

### *IV. Center for research*

The Center for Research on a university campus should understand the rules about intellectual property, but be careful here. One VP at a flagship state university discovered after posters had been hung that the university's annual research showcase was being held off campus in a public venue. His concern is that the rules about disclosure remain cloudy when research is presented to a fairly closed, campus audience, but moving the showcase to a public venue changes the game. It starts a clock that some students do not know exists. It puts potential university patents at risk if graduate students are working on certain kinds of research. The problem, he notes, is that the Center for Research is run by a faculty member who has not shifted their mindset to thinking broadly about what we are asking our invention generation to do.

Off campus, idea incubators, patent programs, and business development assistance provide advice about how to protect intellectual property. And while all of these programs are set up to help, the assistance available still requires inventors to be self-motivated and willing to perform patent and other start-up related research on their own. Faculty who learn as much as possible about the patenting process and what might be available locally to campus and off-campus inventors will be better able to better advise students who develop unique ideas in classrooms.

Because students graduate or their ideas become bigger than an innovation center staff can handle or because they apply for and receive a research grant in the name of their start-up business, students may be referred to off-campus resources. In addition, faculty who are not necessarily eligible for student innovation center services may need to go off campus to find help with business development--as long as they are acting within the university's rules related to intellectual property and business spin-offs.

### *V. Business or research incubators*

State, federal, and privately funded incubators have been established to nurture research and development. These incubators serve off-campus inventors or those who have outgrown campus resources. Incubators typically include office space, meeting space, and office equipment like telephones, fax, and copy machines. Research incubators typically also include laboratory space. Incubators offer educational seminars, financial advising, and access to people who can help protect or sell ideas.

### *VI. Patent & trademark resources*

The patenting process is so complex that even the USPTO offers help to inventors through its Inventor Assistance Center (IAC), which provides general information about the patenting process or help filling out

forms. The IAC will not offer advice about whether an idea is patentable or help with patent searches [18].

For patent research, inventors can try to visit a designated Patent and Trademark Resource Center (PTRC). These centers are housed in libraries designated by the USPTO to provide assistance to the public. Many of them are housed in university libraries, and a list is available online [19]. PTRCs have librarians on staff who can help with initial patent searches or who can teach you how to conduct a patent search.

Some universities have a patent program that is funded by the attached law school or by the state to help students and community members with filing patent applications. A large part of the patent application process is searching past patents to see if the idea has already been patented. The patent program is generally managed by a licensed attorney specializing in intellectual property and staffed by law students who are learning about intellectual property. The student lawyers can conduct prior art searches and help inventors determine whether a patent application should be filed.

### *VII. Business development resources*

Small business development organizations offer free counseling for anyone hoping to start a business. These organizations offer workshops and one-on-one business counseling.

As faculty, having an understanding of the resources available to students, faculty, and community members is helpful in determining how to handle ideas in your class.

## ASSESS YOUR INSTRUCTIONAL ROLE IN STUDENT IDEA GENERATION

Are you asking students to generate ideas? Usability test a website, software, or other product? Work on research you are conducting? Write a recommendation report for a product improvement? As mentioned earlier, class discussions can start the patent clock, so having a roundtable to discuss project ideas or to give status reports may have a legal consequence. To prevent inadvertent disclosure of ideas, think in terms of intellectual property when designing assignments and projects at each step of the project:

### *I. Project development*

If part of the process is class discussion and feedback, you may need to ask students to sign a non-disclosure agreement (NDA). Do not assume that if students do not talk about their ideas out loud that the ideas are protected. As creators and designers, we like to get feedback about things we are working on, so they will probably talk to others about their ideas anyway. You want to make sure you are preparing students to also think in terms of their own IP, and having an NDA in place in the classroom will

make them think twice before discussing the idea in front of others during lunch.

If you are not sure whether your project needs an NDA or other parameters, call up your technology transfer office or the student incubator and ask. They will be happy to have been consulted and will advise you well. They also will provide a university non-disclosure agreement. Do not write your own, if at all possible. In terms of which office to call, the technology transfer office is the keeper of policy; the student incubator carries out this policy on behalf of students and has students' best interest at heart.

### *II. Project start*

If you ask students to sign a nondisclosure agreement, explain why, and make sure students understand this is a legally binding document. Until you are comfortable talking about ideas and how to protect them, ask a representative from the student incubator to come chat with the class. This visit will give the incubator a chance to market its services, which are almost always free to students, and a chance to get students excited about the upcoming project. You will also start learning about how ideas are protected on campus.

Even if you are not sure that your class will result in novel ideas, this generation of students needs to know how to protect ideas and what to do when an idea does emerge.

### *III. Class discussions*

When discussing projects in class, remind students the room has a non-disclosure agreement in effect as class begins.

### *IV. Project conclusion*

Allow the business incubator to offer guidance in how to conclude assignments with ideas that might be protectable. A showcase in the classroom might be acceptable with non-disclosure agreements in place, but a poster session in the hallway might not be.

Not every idea will be a good one, so you may be setting up non-disclosure structures for only one student or one student group. You may have a room full of good ideas, but none are really worth pursuing financially. The value in having students sign non-disclosure agreements and learn about how to protect ideas, however, gives students tools to understanding how ideas are sold or traded.

For example, one student might develop the idea for an interactive children's book for kids with a specific disability. On the surface, the idea looks like a book plus another item already on the market combined to create a good experience for a specific group of children. Neither of these is patentable, but the idea might be marketable. Without an NDA in place, a classmate who is a savvy marketer, could move the idea to market.

## WHAT TO DO WHEN YOU FIND A PROTECTABLE IDEA

If you believe a student has an idea that might be protectable, follow this agenda:

**Talk to the student:** Explain to the student that you think they have a good idea and that they might need to protect it. The student may balk or may not understand what you are trying to say. If your university has a student innovation center, ask that the student make an appointment to talk to someone there.

At the innovation center, trained staff will evaluate the idea and give the student direction. The first thing that will happen at the meeting is that everyone will sign confidentiality agreements which will keep the incubator staff from heading over to the Union and saying, "You won't believe the idea I just heard about. It's so cool," and then go on to blab about it.

**Attend meetings with the student:** When you are first working with ideas that might be protectable, attend meetings with the student so that you can also learn as much as possible. You will be able to start discerning the difference in a good business idea that can't be protected, an idea that needs patent protection, and an idea that might fall under trade secret. None of these ideas need to be placed on a poster for a public showcase until the business has launched or the idea has been protected. Trade secrets never go on a poster. (Think of the rumors surrounding the recipe for Coca-Cola.)

**During the meeting, develop an action plan:** During the meeting, develop an action plan that establishes parameters about how to handle the idea for the rest of the semester. What does your project assignment require? A class presentation? A public showcase? Leave the meeting knowing what the student should and should not do. Consider modifying the student's assignment so that the idea can be moved forward during the remainder of your course. Instead of a class presentation, perhaps the student will work on a confidential action plan based on recommendations from the meeting.

Leave the meeting knowing these pieces:

- Whether the student has an idea worth protecting or pursuing
- Who else the student should contact
- An action plan for the rest of the semester
- How much confidentiality is required

Not every idea is considered novel, or new, according to the U.S. Patent & Trademark Office. Not every idea is patentable. Going through the steps of having students' ideas evaluated will show you how to discern the difference between ideas students have.

## PARTING THOUGHTS

We did not find a university policy that requires faculty to act when they encounter a protectable idea. Yet. We found no lawsuits involving students suing because their schools failed to tell them their idea might hold

value. We can look to Facebook® to know friends have sued friends. Facebook® founder Mark Zuckerberg's best buddy and initial partner, Eduardo Severin, sued over Facebook ideas [20]. We found lawsuits filed by former students who allege their academic advisors published the student's idea under their own name, essentially preventing the student from receiving scientific credit toward the idea. In two cases, the U.S. Courts sided with the university. In *Stern v. Columbia University* (Fed. Cir. 2006) the judge held that the student did not have sufficient or sophisticated enough knowledge to have contributed to a patent [21] In *Obidingo v. Binghamton*, the student failed to finish his doctorate after his dissertation advisor allegedly took his dissertation research and published it under his own name [22].

The decisions in lawsuits involving former students seem to hold the underlying assertion that advisors are knowledgeable about patent rules on campus and about patents in general. Research in technical communication related to IP has been going on for at least two decades, but so far, research related to IP and technology transfer has remained a specialized area. But, given the federal funding directed toward teaching about innovation starting in Kindergarten, technology transfer and work related to intellectual property needs to become core knowledge in the field of technical communication. Faculty in technical communication will then be prepared to teach other faculty in the humanities about how to handle ideas in the classroom.

## ENDNOTE

1. This information was gained via personal communication in March 2016 with a Senior Legal Advisor, Office of Patent Legal Administration, Office of the Deputy Commissioner for Patent, Examination Policy, United States Patent and Trademark Office. We thank them for their time and conversation.

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