

## Arab Idols: Multidisciplinary Mentoring Panel Critiques Design Team Performance

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## Arab Idols: Multidisciplinary Panel Critiques Design Team Performance

### Abstract

The multidisciplinary engineering design course described in this paper was conceived to give students the opportunity to practice both discipline specific and inter-disciplinary collaborative tasks in the solution of a design problem requiring diverse skills. The authors recommend an educational model that provides ongoing weekly panel reviews between multidisciplinary student teams engaged in a design project and a multidisciplinary mentoring panel. The format developed as the principal investigators/mentors realized they were able to provide teams diverse live feedback from the different perspectives of their disciplines. In a format resembling interactive reality TV talent shows the faculty panel critiqued the “performances” of the design teams’ progress on a weekly basis. The format not only provided critical project technical guidance and project tracking but had the added bonus of enhancing the students’ soft skills through weekly presentations. The course combined second-year mechanical and electrical majors on 15 teams whose semester project, *Mobile Vehicle for Hazardous Waste Cleanup*, was chosen for its multidisciplinary components requiring both parallel and integrated efforts on the part of the students. The mentoring panel was comprised of 3 technical faculty (2 Mechanical, 1 Electrical) and 1 Communications faculty, each offering different views and recommendations to the teams.



**Figure 1** In a format resembling interactive reality TV talent shows faculty mentors at The Petroleum Institute of Abu Dhabi provide multidisciplinary feedback to design team.

Seventy-five students were surveyed about their satisfaction with the course and project.

The students acknowledged several dynamics that evolved from the multidisciplinary format as positive:

- ✓ A cumulative effect of multidisciplinary information gathering
- ✓ Eye-opening preparation for future work with other disciplines (learning what other disciplines do, how they approach problems differently)
- ✓ The unexpected acquisition of skills in the “other” disciplines

The students acknowledged the following challenges:

- ✓ Lack of understanding of the other disciplines (jargon, technical skills)
- ✓ Difficulty of combining the multidisciplinary subsystems of the project into their design

## Introduction

In the past 20 years industry and engineering educators have recognized the need for engineering students to acquire not only technical competencies but also soft skills associated with the practices of engineering, including teamwork, communication, project management, interpersonal skills, leadership, marketing skills, and life-long learning skills. While teamwork has long been considered an integral part of a design program, not all universities, including ours, offer multidisciplinary courses or courses that expose students to “concurrent design work” methodology.<sup>1</sup> The practice of these more recently recognized methodologies trains students to perform parallel and integrated tasks in the design process and to practice important interpersonal communication with colleagues in other disciplines.

The second-year multidisciplinary engineering design course described in this paper brought multidisciplinary design education back to a The Petroleum Institute of Abu Dhabi, UAE. Although the original model for the program included second-year courses that combined Chemical, Electrical, and Mechanical disciplines back in 2003, these courses were abandoned as the institute grew and the programs wanted to direct their own second year design curriculum. As a response to current research owning the value of multidisciplinary design education, a proposal to re-introduce a multidisciplinary course was submitted and approved for a mini-grant for spring semester 2013. The primary goal of the principal investigators was to develop a best practices model that would satisfy identified objectives in contemporary multidisciplinary design education.

While the format of the multidisciplinary engineering design course described in this paper wasn't conceived with the intention of mimicking interactive reality TV talent shows, students and faculty alike recognized the similarity of format as it evolved. Not only are our students familiar with the American versions of these talent shows - *American Idol*, *America's Got Talent*, *The X Factor*, etc., - they are watching versions of these shows within their own culture including a franchise version of Simon Fuller's British *Pop Idol* called *Arab Idol*. In nearby Afghanistan, the *Afghan Star* singing competition is so popular that fans go to extraordinary lengths in remote areas to watch the live broadcasts. According to Cynthia Schneider, former US ambassador to the Netherlands who studies cultural engagement in the Muslim world “it all begins with enjoyment” that takes on different interpretations.<sup>2</sup>

## **Students practice design in a broader and more diverse context.**

The spring 2013 course provided an opportunity for students to practice their acquired design skills from first-year design in a broader and more diverse context than the discipline-specific technical confines of the previously segregated second-year design courses. “Second-year Multidisciplinary” provided an opportunity for students to work in synthesis, collaboration, and concurrency with students outside their majors in an effort we hoped would help prepare them for optimal work in industry in the 21st century.

In an article in the *European Journal of Engineering Education* R. Martin et al. discuss engineering graduates’ perceptions of how well they were prepared for work in industry. The authors point to the global trend toward outcomes-based accreditation as the impetus for scrutiny of the skills and knowledge a student has upon graduation. Since outcomes based curriculum is often driven to meet the needs of industry, and given the prevalence of teamwork in industry, an area of concern for the authors was work in multidisciplinary teams. Interviews with chemical engineering graduates who went on to work on multidisciplinary teams in industry said that “they battled to communicate effectively with electrical and mechanical engineers when they did not know enough about the work done by these other disciplines”.<sup>3</sup> Given the segregated nature of some engineering programs (like our university) this can lead to a competency gap.

Seventy-five students participated in the spring 2013 Electrical/Mechanical Multidisciplinary course: 47 males and 28 females (segregated by gender). There were 9 teams of men and 6 teams of women, mixed as to mechanical and electrical but with a preponderance of mechanicals due to enrollment. The mentoring panel was comprised of 3 technical faculty (2 Mechanical, 1 Electrical) and 1 Communications faculty.

The composition of teams was designated by the instructors. Our students voiced opposition to this strategy, preferring to work with people they knew. At the Petroleum Institute we have a culturally diverse student body composed of nationals and expatriates from all over the Middle Eastern region. Although connected by Islamic culture and tradition the students come from diverse backgrounds. They voiced some initial discomfort about the compound challenge of becoming multicultural members of multidisciplinary teams. They also possessed a degree of competitive pride in their preferred and chosen fields. According to a 1992 survey of industrial managers published in *ASEE Prism*, design education should: 1) emphasize a multidisciplinary, team-based approach to solving problems, and 2) allow students to recognize the value of collaboration rather than competition to achieve high-quality, well designed products or processes.<sup>4</sup> It was in this spirit of collaboration that we wished the teams a successful semester.

## **The project “Mobile Vehicle for Hazardous Waste Clean-up” becomes a common goal and uniting factor for the multidisciplinary team members.**

Contemporary international educational research supports teaching engineering design synthesis, collaboration, and concurrency among engineering disciplines. The National Academy of Engineering’s (NAE) *Engineer of 2020: Visions of Engineering in the New Century* explores the kind of environment that future engineers will face and how engineering must adapt to remain

relevant, considering vast societal and technological changes. Chapter 4 sets forth the attributes needed for the graduates of 2020, including “find(ing) ways to focus the energies of the different disciplines of engineering toward common goals.”<sup>5</sup> The project, “Mobile Vehicle for Hazardous Waste Cleanup,” was chosen for its multidisciplinary components requiring both parallel and integrated efforts by the mechanical and electrical majors. Introduced early in the semester it provided the focal point for the teams’ individual and collective brainstorming. Teams were informed that their final designs/prototypes would be demonstrated in a competition at the end of the semester.

Students were required to design and build a mobile vehicle that could retrieve 1.5 kg water bottles from a designated “pick up” area on a custom built track and relocate as many of them as possible to a “drop off” area within 2 minutes. Mechanical design requirements and challenges included the performance of the following functions:

1. Pick up, attach to, or grasp / clamp onto the bottle(s).
2. Lift or raise the bottle(s) off the ground.
3. Hold onto or store the bottle securely for the return journey.
4. Release, eject or deposit the bottle within the square area.

The bottle collection and release system also had to satisfy the following objectives and constraints:

1. Made of locally available lightweight (under 3 kg) and affordable materials.
2. Easy to mount on a remote controlled vehicle.
3. Easy to manufacture.
4. Fits within the maximum size limits (400 mm long x 300 mm wide x 400 mm tall).
5. Fast, reliable, and predictable performance.
6. Easy to assemble and disassemble, for maintenance purposes.
7. Ideally, made of energy-efficient and environmentally friendly materials and components.

The project, from an electrical engineering point of view, had two major challenges: 1) steering the vehicle remotely when it was loaded or unloaded through the determined path, and 2) carrying the load and then releasing it at the destination area. In all cases, students had to know/learn how to apply wireless controller technology to remote-control mechanisms or devices from several meters away using wireless joysticks, RC hand-sets, and so on. This remote-control set had to control the speed and direction of the actuator (electric rotating motor). It was essential to control the speed of the vehicle when it approached turns or objects. An even more important issue was directing the vehicle motion forward or backwards and the load gripper for up and down motions.

Building a complete working electric system required the students to follow certain steps:

1. Design an electric circuit of the target system on a paper.
2. Simulate the circuit for analysis using electrical simulation software such as Matlab/Simulink, Multisim or Labview.

3. Build a PCB (Printed Circuit Board) and test the actual circuit performance.
4. If a microcontroller is involved, program it accordingly.

Students learned that performance testing, problem identification and debugging skills were essential for trouble-shooting their electric circuit systems.

**Researching the project: Students discover a cumulative effect in multidisciplinary information gathering.**

Early in the semester teams were required to identify areas of research and assign those areas to appropriate team members who then generated research questions. One of the women’s teams generated the following table:

**Table 1** Research questions identify discipline specific and inter-disciplinary tasks.

Research questions	Discipline	Team member
What are the major mechanical components involved in mobile robots? How are they implemented in the design?	Mech	Bidisha
What are the types of gripping mechanisms in mobile robots? How can failure of the grippers be avoided? What are the methods used to maximize load tolerance?	Mech	Hagar
How are robots and robot arms assembled together?	Mech	Mariam
What are the different types of radio controlled (RC) car kits?	Mech	Zaina
What are the important types of electric components used to build mobile robots? What are the different types of programming systems that are used to program mobile robots?	Elect	Amena

Individuals had to identify how their research areas related to the overall project as well as to the other discipline’s activities. One of the men’s teams recognized in their background research report that “(s)everal of the mechanical and electrical aspects of this design project overlap. For example, the implementation of the right kind of gears and motors is a crucial step which would require both electrical and mechanical engineers to work together. In order to ensure that these parts eventually fit together in perfect harmony, the electrical engineers may need to study certain mechanical aspects of the design and vice versa.”

By mid-term the students voiced recognition of the advantages that the multidisciplinary diversity of their teams bore to their research. Reaching across the usual discipline specific boundaries that pre-determined their former research strategies yielded more and better options for their design.

**Project Reviews: “Arab Idols” teams “perform” weekly for multidisciplinary mentors.**

The course requirements and deliverables were designed to emphasize professional project management skills and tools beginning with the teams’ development of a detailed project plan that served as a compass for all ensuing work during the semester. Five weekly contact hours consisted of a multidisciplinary class and discipline specific lab. Grades were assigned for individual work (I) and teamwork (T).

**Table 2** Course deliverables emphasize project management.

<b>Assignment</b>	<b>Type</b>	<b>Weight %</b>
Project Plan	T	15
Project Plan Presentation	I/T	5
Background research	I/T	5
Project reviews	I/T	10
Contribution to teamwork	I	5
Engineering graphics and CAD (mechanical students only)	I	20
Electrical engineering lab and computer applications (electrical students only)	I	20
Final presentation	I/T	5
Final report	T	30
Project portfolio	T	5

Weekly project reviews are shown above to reflect only 10% of the total grade but these reviews actually highly influenced the teams' total scores in many ways. During these reviews the teams were required to demonstrate time, task and personnel management through the use of project management tools, specifically a Work Breakdown Structure, Gantt chart, and a Linear Responsibility Chart. Project progress had to be demonstrated through a live demonstration of a Percentage Complete Matrix. In addition to the project management tracking the review venue provided the teams a chance to bring in their prototypes in various stages of completion for hands-on help from the multidisciplinary mentors. Challenges and problems were aired. Mentors critiqued the teams on their level of preparedness, quality of demonstrated tools, design feasibility, professionalism, visuals, organization, language skills, oral presentation skills, and enthusiasm.

Like in the immensely popular interactive reality TV talent shows, the student "contestants" demonstrated or "performed" in front of a live audience, a panel of mentors or "judges," who critiqued them. There were a few wisecracks and blunt appraisals but most of the critiques were aimed at getting and keeping the students on track and guiding their design process. Like Simon Cowell's grillings, the questions prompted critical thinking on the part of the contestants. "Well, how do YOU think you did?" "What do YOU need to do better next time?"

Classroom time constraints limited the project reviews to 15 minutes per team. It was not possible to catch all of the problems before the final competition and the mentors didn't want to "solve" the problems for the teams, but we did our best to guide the students to realistic solutions without controlling their creative process or dampening their spirits.

This format gave teams a chance to discuss their designs in a private setting before the public demonstration of their prototypes in the final competition. Unlike reality TV, these panel reviews were not viewed by a larger TV audience, i.e., the rest of the class was not privy to reviews of other teams. Some of the more confident teams wanted to keep their designs "behind closed doors" (viewed by instructors only) so that their designs would not be imitated by other



teams. Other teams were simply grateful for the chance to voice their frustrations and welcome options for improvement of their designs in a setting that didn't cause them embarrassment..



**Figure 2** Multidisciplinary mentors find themselves out of their disciplinary boxes; here a Communications mentor offers design suggestions.

**Student feedback at mid-term reflects heightened regard for multidisciplinary activities.**

Three surveys were administered. The first survey captured attitudes prior to the course and the second survey measured the students' outlook at mid-term. The mid-term and final surveys included questions requiring subjective response.

**Table 3** Pre-course vs. mid-term attitudes to working on multidisciplinary teams.

Pre-Course and Midterm Attitudes	% Agreeing or Strongly agreeing	
	Pre-Course Survey	Mid-term
I prefer to work with colleagues in my own discipline.	78.0	47.2
I am nervous about working with colleagues in other disciplines.	19.5	22.7
Multidisciplinary teams take longer to solve problems than single discipline teams.	31.7	25.0
Single discipline teams produce better designs.	21.9	15.9
Different disciplines solve problems differently	85.4	72.5

I know a great deal about what engineers in other disciplines do.	24.3	Not repeated
I have learned some things about what engineers in other disciplines do.	Not in first survey	47.7

It was clear by mid-term that the students had lost many of their reservations about working on a multidisciplinary team and had, in fact, gained appreciation for advantages to problem-solving, design quality, and the acquisition of skills in other disciplines. A spirit of friendly competition between disciplines remained, however, as one student remarked that the best thing about the multidisciplinary course was “making fun of the other discipline through showing the best of our discipline.”

At mid-term, the students were asked to identify advantages and disadvantages of working on multidisciplinary teams. The tables below illustrate their responses.

- A. *What is the best thing about working in multidisciplinary teams?*
- B. *What have you learned from a teammate in another discipline?*
- C. *What is the worst thing about working in multidisciplinary teams?*

Nearly all the students agreed that the most important advantage of working in multidisciplinary teams was the cumulative effect of shared knowledge which led to a fuller understanding of the design objectives and thus a better product. Scheduling conflicts and differing professional jargon created some challenges.

**Table 4** Students identify advantages to working on multidisciplinary teams

Summary of student responses: Advantages of working in multidisciplinary teams	Corresponding student comments
<b>Sharing knowledge.</b> Responses described the experience of combining expertise for a fuller understanding and better product: the cumulative effect of information gathering, gaining knowledge, and sharing experience through the multidisciplinary diversity of the group.	“Sharing knowledge to reach our goal” “Less risk of failure” “Less time to produce the product” “Workload can be divided according to the corresponding disciplines” “Diversity in ideas”
<b>Enhancing soft skills.</b> Students acknowledged enhancement of teamwork, communications, intercultural awareness, competitiveness, and conflict resolution.	“More brainstorming and experience being shared; more nationalities to know about” “Sharing experience and developing social skills” “Showing the best of our discipline to the other discipline” “Listening to each other and respecting our ideas”
<b>Preparation for the future.</b> Students also recognized that the course would prepare them for future work with other disciplines: knowing what other disciplines do, how they approach problems differently.	“See what we will have to know in our careers.” “Understand how to handle diverse backgrounds now to train us for later”
<b>Unexpected acquisition of skills in the other discipline.</b> The students had a serendipitous reaction to the uncharacteristic skills they were acquiring.	“Working on Ehab’s Macbook and learning interesting mechanical ideas”

In spite of the inherent rivalry between the mechanical and electrical majors they readily acknowledged gaining a broader view of the project and actually acquiring skills in the other discipline.

**Table 5** Students identify skills acquired from a teammate in another discipline

Summary of student responses identifying skills	Corresponding student comments
<b><i>Different ways of thinking and problem solving.</i></b> Students acknowledged the broadening and shifting of their project paradigms through the perspectives of the other discipline.	“Different ways of thinking. Solving problems in many ways” “Looking at every decision from different perspectives” “Critical thinking” “I have learned from my teammates from ELEG that I should look at the problem from different points of view”
<b><i>Specific technical skills acquired from the other discipline.</i></b> The students were surprised and pleased that they had picked up technical skills from the other discipline. They said that this revelation caused them to feel less uncomfortable with the other discipline.	“Energy conversion” “How DC motors work” “Mechanical analysis of designs” “Soldering” “How to connect simple electric circuits” “Solidworks drawing, sketching, some knowledge about robotics” “In general I am learning how the mechanical components are connected with the electrical” “How to use a combination of resistors in order to make motors slower or stronger”

On our campus and other campuses the various academic disciplines are often fairly secluded from one another due to housing, classes, labs, and discipline activities. The students also acknowledged their inexperience with the discipline-specific jargon and technical skills of their counterparts.

**Table 6** Students identify disadvantages to working in multidisciplinary teams

Summary of student responses identifying disadvantages	Corresponding student comments
<b><i>Scheduling and time conflicts.</i></b> This was largely a “local” problem because of the different housing locations of disciplines on our campus. It also arose from non-mutual schedules in their other classes.	“Arranging meetings” “Common time”
<b><i>Reaching agreement.</i></b> Students acknowledged the challenge that the competitiveness of their disciplines added to decision making.	“Agreement about decisions. Everyone thinks he has the best idea” “Takes a lot of time to reach agreement”
<b><i>Lack of understanding between different disciplines.</i></b> Students did not share the same disciplinary jargon.	“Understanding of people from other disciplines who have other ways of thinking” “Not everyone can understand what you are talking about” “Sometimes the mechanicals try to force their bad ideas on us”

*Difficulty in combining the mechanical and electrical aspects of the project.* The students said this was a challenge to envisioning the finished product.

“Difficult to combine electrical and mechanical ideas”  
“Science misunderstanding”

### End-of-semester competition and poster session attracts multidisciplinary attention.



**Figure 4** Students and faculty jostle for viewing position as the competition attracts a large multidisciplinary crowd on several stories of the building.

At the end of the semester teams were asked to demonstrate their prototypes in a friendly competition on the custom-made track. Their mobile vehicle “robots” had to retrieve 1.5 kg water bottles from a designated “pick up” area on the track and relocate as many of them as possible to a “drop off” area within 4 minutes. The event was a huge success and attracted students and faculty from all of the disciplines on campus. The most challenging features of the design competition involved the track itself. The sand pit caused wheels to sink and spin, and sometimes bog down. The stone pit provided an uneven terrain where the vehicles sometimes shifted or tipped over. After picking up the bottle the mechanical dynamics were changed in terms of balance, affecting the overall stability of the vehicle. Vehicles lost bottles, tipped over, or failed mechanically.

There were 4 teams that were able to successfully collect and retrieve 1 or more bottles, out of the total of 9 men’s teams, and each of their bottle-pickup mechanism designs was unique and successful. Some designs were very close to being successful, but failed catastrophically on the



day of the competition. Some mechanisms failed due to mechanical failure (due to weak glue / adhesive failure), excessive pressure (pipes bursting), cables being tangled on gears (poor reliability) and even bad ideas (designs that had no chance of working in the first place); however, the overall competition was a valuable introduction to prototyping and experimentation according to most of the students. The competition was repeated with the women's teams with like enthusiasm and similar results.



**Figure 5** Mechanical mentor (kneeling) designed and built the custom obstacle course/track.

### **Final survey yields students' attitudes about the multidisciplinary project reviews.**

At semester's end the students were asked to respond to the following:

*The Project Review format was similar to interactive reality TV talent shows. Was the weekly multidisciplinary reviewing panel (Mechanical mentors, Electrical mentor, and Communications mentor) helpful or not in guiding your team's progress with the project? Explain your answer.*

Answers were positive, and can be organized into 3 major areas: project management, project design, and soft skills. In addition to the surveys, it can be reported that when the course was finished many students came around to members of the mentoring team to express anecdotally, often humorously, their appreciation for the unconventional format of the course. Several students remarked that they enjoyed watching the mentoring team interact. They figured out that

their instructors were modeling successful interdisciplinary communication and camaraderie. What a wonderful compliment.

**Table 7** Student feedback regarding the project review (interactive talent show) format

Identified area of assistance provided by the format	Corresponding student comment
<b>Project management.</b>	“Guided us and helped us organize our future tasks” “Recognize gaps and delays in progress” “Made sure progress matched our schedule”
<b>Project design.</b>	“Help develop ideas for the project” “Provided helpful feedback on our concerns” “When we encounter an obstacle, they recommend approaches that lead to a better design” “Gave us continual awareness of the requirements of the design”
<b>Soft skills.</b>	“Engaged all the team members in discussion and critical thinking” “Improved self-confidence in team presentations” “Pointed out how to present our project professionally. Made me feel important.” “Beneficial to our motivation” “Enhanced students’ comfort and experience in a multidisciplinary project”

**Conclusion: Our best practices model includes weekly multidisciplinary mentoring for multidisciplinary teams.**

Multidisciplinary mentors and students agreed that the weekly project reviews were helpful in keeping the teams on track, in helping them develop better and more feasible designs, and by guiding them to recognize a variety of important professional soft skills. The reality TV talent show format added both the drama of competition and the light-heartedness of an enjoyable and recognizable venue.

To summarize, the students acknowledged several dynamics that evolved from the multidisciplinary format as positive:

- ✓ A cumulative effect of multidisciplinary information gathering
- ✓ Eye-opening preparation for future work with other disciplines (learning what other disciplines do, how they approach problems differently)
- ✓ The unexpected acquisition of skills in the “other” disciplines
- ✓ Enhancement of soft skills through multidisciplinary interpersonal socialization

The students acknowledged the following challenges:

- ✓ Lack of understanding of the other disciplines (jargon, technical skills)
- ✓ Difficulty of combining the multidisciplinary subsystems of the project into their design

The mentors met several times before the course started and once a week during the semester to plan coursework and share ideas. In a sense we had a similar experience to the students; that is, we had different disciplinary backgrounds, different outlooks, and different approaches to problem solving. We recognized:

- ✓ A fuller understanding of team progress through the different perspectives of other instructors
- ✓ Enlargement of the capacity to offer solutions to teams that are “stuck”
- ✓ Unexpected crossover of technical and soft skill advice (mechanical instructors directing presentation posture, communications instructor suggesting a design alternative)
- ✓ Unique and exceptional professional opportunity to pursue a common goal with multidisciplinary colleagues

We highly recommend the weekly gatherings of mentors. In a sense we trained one another for the course.

Our mobile vehicle project turned out to be a good but very challenging choice for the multidisciplinary Mechanical/Electrical course as the students did not have a great deal of background in some of the more technical tasks the project required. Projects should be chosen at an appropriate level of difficulty for each discipline involved.

Because of enrollment some of our teams were short in electrical expertise. We recommend teams have close to equal distribution of disciplines. Team size should not exceed 6.

The mentoring team encourages and supports the development of multidisciplinary teams/projects across the curriculum at our university. Not only is it conceivable that this pilot course would inspire multidisciplinary projects/courses across this curriculum, but that it would inspire multidisciplinary projects with other universities and industry. Achieving broader impact means expanding across this curriculum and sharing models with other engineering educators.

Institutional excellence in multidisciplinary design education is growing. Successful multidisciplinary programs may be found at many prestigious engineering universities. Harvey Mudd’s Engineering Clinic requires students to work on multidisciplinary teams to solve open-ended projects requiring interaction with a client and communication with various audiences orally and in writing. Michigan’s “Multidisciplinary Design Program” offers students “the opportunity to use engineering knowledge to design, build, test and implement new and interesting projects working with a team of students who bring a variety of academic backgrounds and ways of approaching a problem.”<sup>6</sup> Purdue’s MDE (Multidisciplinary Engineering) Program provides the following rationale for its program: “The national landscape of engineering is changing. Fast-moving, global, multidisciplinary environments require graduates to have not only the traditional technical knowledge of their predecessors, but also a new and broader skill set.”<sup>7</sup>

The Petroleum Institute and others need to meet ABET’s fourth outcome (out of eleven) in the current ABET “General Criteria” schedule for engineering students:

(d) an ability to function on multidisciplinary teams<sup>8</sup>

The multidisciplinary course described here responds to a new societal and technological landscape in the 21st century. It is important that our students recognize that engineering practices in a globalized and interdependent world are not conducted in isolation. The students were observed to change their attitudes about working with other disciplines and the “Arab Idol” format proved that such recognizable venues not only cross cultures but inspire new frameworks for multidisciplinary engineering design education as well.

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