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MAKER matic

A Scalable Approach to Team Internships

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ACKNOWLEDGEMENTS

Accomplishments in makerspaces most often are the result of a collaborative effort. Creating Makermatic was similarly a collaborative effort by the CCC Maker Advisory Committee, the CCC Maker team, and the inspiring work of the vanguard makerspaces that led the first Makermatic sessions. The CCC Maker team—led by led by Carol Pepper-Kittredge and staffed by Karen Fraser-Middleton, Deborah Bird, Toni Edgerton, Jennifer Ulrich, Salomon Davila, and Paul DeVoe—wish to acknowledge the contributions of:

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WELCOME TO MAKERMATIC

The direct connection between college students and the business world has never been more tenuous. Internships have traditionally been a vital link, but colleges find it difficult to structure sustainable, scalable business internships to help prepare students for the job market. The time and effort it takes for colleges to build business community relationships, define internship roles and expectations, meet intra-college expectations, and *then* execute the convoluted rules of hiring, liability, and documentation are understandably daunting. The Makermatic program was born out of a desire to completely reimagine the way that college-based internships are structured.

Makermatic's parent program, CCC Maker, is a three-year initiative funded by the California Community College Chancellor's Office (CCCCO) to build a network of makerspaces at 24 California community colleges. The CCCCO holds that growing a statewide network of makerspaces linked to community colleges can help develop a much-needed workforce for what is being termed the digital or innovation economy. Further, creating this makerspace network can effectively help bridge the gap between skills and jobs, becoming a crucial catalyst in strengthening California's economy.

An integral function of CCC (California Community College) makerspaces is serving as a bridge between students and the business community. Makerspaces are uniquely positioned to bring together access to tools, technologies, social connections, mentoring, and instruction in a supportive environment. Makerspace students often seek inspiration, skills, and opportunities to pursue a career that fits their interests. The Makermatic model also strives to fulfil these student needs.

HOW THE IDEA WAS DEVELOPED

The CCC Maker Advisory Committee, comprised of some of the Maker Movement's leading movers and shakers, considered the challenges of current college internship models and saw the possibility of reinventing internships by centralizing them in makerspaces. The Committee also observed that 1) the potential of the community college student was under-imagined, and 2) the business community had real business problems that it would gladly share with students as topics for learning and a source of creative solutions.

Businesses very often want to give back to the community by supporting colleges and may even be interested in offering internships but just not know where to start. For businesses, it's time-consuming to recruit interns and develop structured internship programs. The challenge that the Advisory Committee presented to the core CCC Maker team was to bring together talented interns and business leaders to solve real-world business problems in a makerspace setting.

In the true spirit of makerspace innovation through experimentation and iteration, the CCC Maker team worked to develop the bold idea to build an internship model that was scalable, based in college makerspaces, and connected to business leaders. The goal was to design a scalable program that creates a meaningful experience for both the interns and the collaborating business, and to be able to demonstrate a positive impact on the students, the makerspace, and the business.

The CCC Maker team wrestled with these kinds of questions:

- Could we leverage the natural "connector" role of a makerspace to serve as a meeting place for student internships mentored by engaged business leaders? Would the students and businesses find this appealing?
- Could we build this program so that it was scalable? Is it possible to move from a traditional model of onboarding one student for one internship to a model that onboards potentially dozens of students into an internship that is mentored by one or two business leaders?
- Is it possible to provide a guided program that is replicable, effective, and demonstrates positive impact for the students, the college makerspace, and the contributing businesses?
- Would the experience help interns consider new career possibilities? Would the internship help students develop new soft skills that would help them find meaningful employment?
- Would the business leader gain new valuable insights from the interns that make the time invested cost-effective and meaningful to furthering business goals?

In broad brushstrokes, the team discussed ways to meet the challenges posed by these questions. During one meeting, the novel idea of bringing the business to the interns instead of the other way around was considered. The team recognized that this idea had strong possibilities and decided to rapidly build a model program, socialize the key concepts (many of which were novel), and test it in the field. The moniker *Makermatic* was given to this program because "maker," meaning "to make or produce something," paired with "matic," meaning "a willingness," seemed like an appropriate way to describe this scalable internship vision.

PROGRAM OVERVIEW

The Makermatic program was developed and deployed in five CCC Maker college makerspaces—Allan Hancock College, Cabrillo College, Folsom Lake College, Sacramento City College, and Sierra College—during a pilot program. The results are not only promising but have indeed demonstrated a positive impact for colleges, interns, and businesses alike. Colleges were able to offer a high-value experience to interns while increasing the ratio of interns to business partners. Interns gained indispensable skills that translated directly to the workplace. Meanwhile, business partners gained new business approaches, hired interns, and indicated a desire to participate in future team internships.

The comprehensive program step-by-step details of the program are offered in the *Makermatic Workbook for Coaches*, which served as the framework for the Makermatic pilot programs and is freely available on the CCC Maker website. This pragmatic guide contains all the materials needed to implement Makermatic, including the recruitment flyer, application form, and curricular materials for each session. Here we provide a general overview of the program structure.

Makermatic is a structured, seven-session, paid, 20-hour team internship, hosted in any college makerspace, that connects students to real-world business problems. Rather than the traditional one-on-one internship model, interns in Makermatic (up to 25 per internship run) work in teams of four or five students, modeling how work is most often conducted in the business world. This system is not only more efficient and sustainable, but it offers a richer and more fulfilling experience for all involved.

There are four key roles in Makermatic: student interns, business leaders (from a local company or industry), makerspace coaches, and assistant coaches. Working as Makermatic paid interns in the makerspace and guided by at least one business leader and a makerspace coach, students help solve a real-world problem, building skills in problem identification, deep ideation, solution identification, iteration, teamwork, and communication in the process. These are skills that students can use throughout their careers, regardless of specific work setting.

Through its seven sessions, Makermatic offers a prescribed pathway for engaging interns in skill building. And though a structure is suggested, the sessions provide a flexible framework where any one session can be expanded and various business, technology, prototyping, or presentation skills, for instance, can be interjected.

Any size of makerspace can host a Makermatic program; it just takes a willingness by the college, coaches, student interns, and the business community to work together. Makermatic thrives in a makerspace environment of exploration, collaboration, and supportive learning, but this doesn't mean that the makerspace needs to have specific equipment or be of a certain size to host Makermatic.

Makermatic was designed to facilitate paid internships, so colleges that don't have internship funding available to them need to reimagine the way that Makermatic might be delivered. For CCC Maker colleges, the internships were funded by the initiative. Employers may find that sponsoring Makermatic programs is a cost-effective way to build relationships with prospective students, the makerspace, and the community, while working on real business problems.

MAKERMATIC'S SEVEN SESSIONS

The program is divided into seven sessions: two of the days are 2½ hours each, and the rest are 3 hours each. For each session, the program has guided topics and exercises that are meant to be engaging and challenging for the interns. There are instances of whole group work, but much of the activity is done in small four- or five-person teams. The interns are expected to participate (be present and engaged) and act respectfully to their fellow interns, coaches, and business leaders.

The Makermatic format is designed to mirror a "hero's journey" (from Joseph Campbell's *The Hero with a Thousand Faces*). The program begins with interns who are called to a great challenge and guided by mentors. Learning about the business leader's challenge, the interns explore the problems and needed changes that are barriers to achieving the business challenge. Finding good problems to solve, the interns move on to exploring ideas that might lead to useful solutions. Once found, these solutions are refined and presented to the business leader's panel on the final day of Makermatic.

OVERVIEW OF SESSIONS

Using a design thinking lens, the interns work their way through devising potential solutions to the business challenge. Each session builds on the previous. Each session begins with a recap of the previous session and ends with reflective journaling.

Session 1: Welcome to an Amazing Journey

Introductions are made: Interns are introduced to each other, to the process of the internship, to the business leader, and to the business challenge.

Session 2: Narrow the Problem List

Through a series of exercises, interns discuss and identify the potential problems that they're aiming to solve.

Session 3: Gather Ideas

Interns break into teams of four or five diverse members and narrow down on the problem they're trying to solve. Then they brainstorm as many potential solutions as possible.

Session 4: Develop Well-Formed Ideas

Teams work through a series of exercises to winnow down their ideas further and further to select and refine the best one.

Session 5: Show Your Solution, Test Strategies, Form a Plan

Interns test their strategies through exercises. Teams work on refining their solutions, testing strategies, a physical display of their proposed solution, their final presentation, and determine who will do what.

Session 6: Refine the Plan and Practice the Presentation

Teams finish up their physical solution presentation and their final presentation outlines, and they practice their final presentations while coaches listen in to offer feedback.

Session 7: Present Plans to Business Leaders and Get Feedback

Business leaders present more information about their company, including how to apply for employment. Teams give final presentations. Coaches present Makermatic wrap-up.

For the final presentations, a panel of four or five business professionals serve as reviewers to assess each intern's performance on the team presentation. The CCC Maker team developed a rubric to aid the reviewers in rating each intern's professionalism, oral communication, teamwork, and decision-making skills. The rubric includes a four-point scale where interns are ranked either developing, progressing, competent, or proficient.

INTENDED OUTCOMES

Soft skills that are intentionally encouraged include teamwork, personal responsibility, and creativity. Emphasis is placed on the sense that all student interns have important contributions they're capable of making. Fostering interest and connections to potential jobs and careers are also key goals woven into the fabric of the program.

Learning About the Business: During several Makermatic sessions, the business leader gives interns insight into their business and what they do to create commerce. They then present a real-world business challenge to tackle, answer questions about the business, and give a perspective on careers that might be of interest to the interns.

Practicing Career Skills: Developing useful career skills takes practice. Throughout the Makermatic journey, interns get hands-on experience exercising some of these career skill muscles with business leaders and coaches as mentors. By focusing on a real-world challenge, interns practice problem identification, ideation, teamwork, and communication skills. The Makermatic premise is built on the idea that working with business leaders and coaches helps develop skills that can be used regardless of their career aspirations—whether self-employment or being hired as an employee.

KEY ROLES IN MAKERMATIC

Naturally, as in all aspects of the CCC Maker Initiative, the student is at the center of the Makermatic program, guided by one or more makerspace coaches, assistant coaches, and business leaders. In our pilot, the CCC Maker team also had the pivotal role of providing content and guidance, as well as observing and collecting data useful for future iterations.

Students Interns: Students who apply and are accepted into the Makermatic program show an interest in connecting to a program that builds career skills. There is a multi-page application, an interview, and an optional design charette before intern selection. The intern cohort must have at least 12 students—ideally representing a variety of demographics and disciplines—because teamwork is an integral part of the program.

Business Leader: A keystone to a successful program is finding a local business with a business leader who can serve as a mentor to the interns and attend the three required sessions. The business leader serves as a vital connection for the interns to the business world. More than one person from the business can serve in this unpaid role. The business leader has a key role in setting up the business challenge and participating in three of the sessions. Prior to the first session, the business leader works with the coach to create a business challenge—defined as an interesting real-world business problem or social-cause challenge to solve.

During the sessions, the business leader shares insight and details about the problem sufficient for designing solutions. As a mentor, the business leader gives constructive, positive feedback to the interns. On the final day of Makermatic, several others from the business are asked to serve on a panel to assess the interns' plans that they'll present.

Makerspace Coach: From the hosting college makerspace, this person (or persons) is the key resource to ensuring a successful internship program. The coach coordinates the program startup, recruits interns, coordinates with the business leader, and acts as a guide during the sessions. The pre-Makermatic startup duties begin with organizing for the program and sharing the program's purpose and value within the college.

Marketing and holding at least one information meeting are key to gaining student interest. Onboarding the students into an employment program (or other program relevant to the college) is the final important step leading up to the first Makermatic session.

Assistant Coaches: In support of the lead makerspace coach, one or more student assistant coaches help guide small groups of students, as well as help participants develop skills, encourage them to practice 21st century skills during sessions, and facilitate them through exercises.

CCC Maker Team: In delivering our incarnation of Makermatic, the CCC Maker team supported the content and delivery of the program. They also served as liaisons to the Foundation for California Community Colleges, Career Catalyst Program, which administered the intern payroll and liability program.

The CCC Maker team supported Makermatic by organizing and providing the content, checklists, templates, and associated collateral material. Importantly, CCC Maker collected useful data about the program, including intern, business leader, and coach recommendations for program improvement (presented in the latter half of this publication). Finally, the team has made the Makermatic resources freely available for all on the CCC Maker website.

INTERN SELECTION PROCESS

To secure diverse student participation in the program, outreach and recruitment are highly recommended. The more diverse the students (on all levels of diversity, including discipline, age, gender, race, socio-economic status, work experience, and technical skills), the more robust the solutions that will be presented to the business leader and the richer the internship experience for all.

Reaching out to student groups, counselors, and departments on campus is highly recommended, along with traditional flyer distribution and use of the campus notification system to promote Makermatic. In our pilot programs, students were drawn to the opportunity to be paid while gaining experience, all with just a 20-hour time commitment. Once the word is out, the next step is hosting information sessions and an optional charette (collaborative session) for interested students. The *Makermatic Workbook for Coaches* offers samples flyers and an application.

PILOT PROGRAMS

The Makermatic program was first beta tested at Sacramento City College in fall 2018. Feedback from this pilot run was used to make improvements to the original *Makermatic Workbook for Coaches*. Overall, the feedback from the makerspace team, interns, and the business partner was uniformly positive and encouraging for future Makermatics. Then, in spring 2019, the program was expanded to invite five of the 24 CCC Maker colleges to participate in piloting the Makermatic team internship program.

These five colleges— Allan Hancock College, Cabrillo College, Folsom Lake College, Sacramento City College, and Sierra College—were selected by the leadership team based on their high achievement in the traditional internship component of the CCC Maker Initiative and/or their strong outreach to the business community in their service area. This pilot involved an outside evaluator working with the leadership team to collect additional data and report on the impact of the model from all perspectives—coaches, interns, and business partners.

To prepare for the pilot, each college had to: select a lead coach, schedule their sessions, outreach to and secure a business partner, identify and orient assistant coaches, recruit and orient potential interns, select 20–24 students from applications and interviews, hold a design charrette (either before or after intern selection), onboard interns through the hiring process, and assign interns to four or five teams.

The business partners in this pilot represented a wide range of industries: hospitality, transportation, beverage, entertainment, and architecture. In preparing for Makermatic, the coaches made clear to the business partners that the emphasis was not on prototyping new products, but rather encouraging teamwork, personal responsibility, and creativity.

Notably, some colleges ran the Makermatic curriculum verbatim, while others modified it to better suit their timeframe. Sierra College chose to use the basic framework but not the prepared materials.

The business challenges presented to the interns were:

- Allan Hancock College, with Keys 2 the Coast:
  How can we take Keys 2 the Coast to the next level by defining the best focus for revenue?
- Cabrillo College, with Calfee Design:
  How do we attract early adopters, both customers and investors, to the new sleek "Streamliner" electric trike vehicle?
- Folsom Lake College, with Solid Grounds Brewing:
  How do we drive more commuter traffic from the Valley and beyond (San Francisco, San Jose, etc.) up to our space? How do we bring in more first-time customers given our location?
- Sacramento City College, with California State Fair:
  How can we increase attendance at the State Fair?
- Sierra College, with AP Architects:
  From a student perspective, develop a unique, sustainable plan/design for a 21st century Solution Center learning environment at Sierra College that breaks down barriers and eliminates the status quo. What spaces or uses need to be included?

PARTICIPANT DEMOGRAPHICS FOR PILOT PROGRAMS

Due to the recommended recruitment and vetting processes, the participants in the pilot programs were quite diverse (Figure 1). Between the two pilots, there were about 120 interns, six lead coaches, 20–25 assistant coaches, and six business partners. Participating students had taken an average of 35 units with an average 3.21 GPA and represented as many as 17 disciplines. Student majors ranged from Nursing to Digital Media, Business Administration, Computer Science, and Sociology, with Graphic Communication, Engineering, and Undecided being the top three. Students had, on average, spent 6 hours in the colleges' makerspace prior to the Makermatic sessions.

Males and females were almost equally represented among the interns, coaches, and business partners, with 5% of interns self-reporting as non-binary (Figure 2). The average age was 26.9 years (Figure 3), only slightly higher than the average age of all students in the statewide system. The ethnic breakdown was reflective of the geographic locations of the participating colleges. Notably, many of the interns had never been in the makerspace before taking part in the Makermatic program.

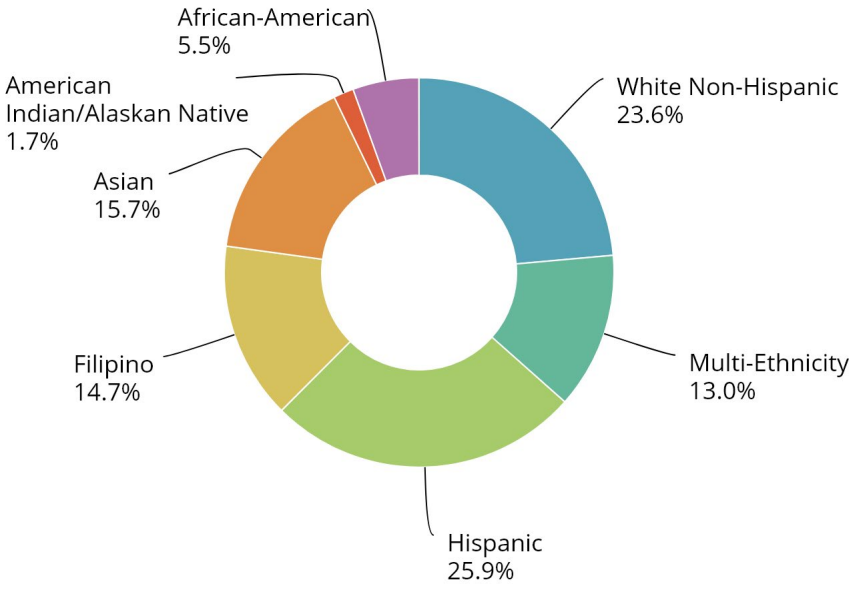


FIGURE 1. MAKERMATIC STUDENT ETHNICITIES

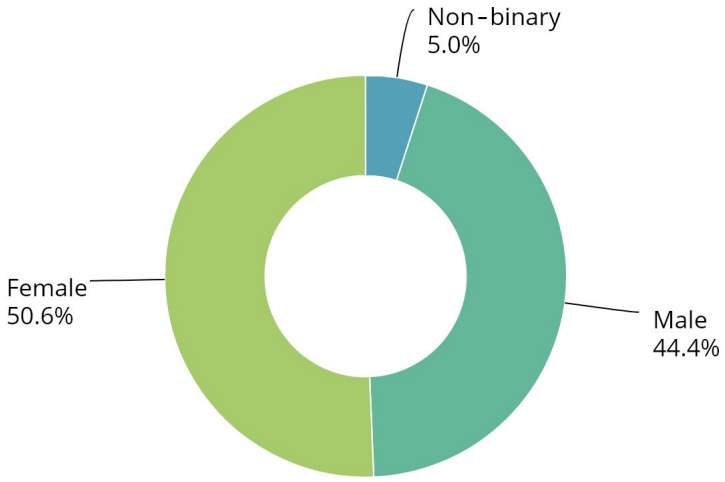


FIGURE 2. MAKERMATIC STUDENT GENDERS

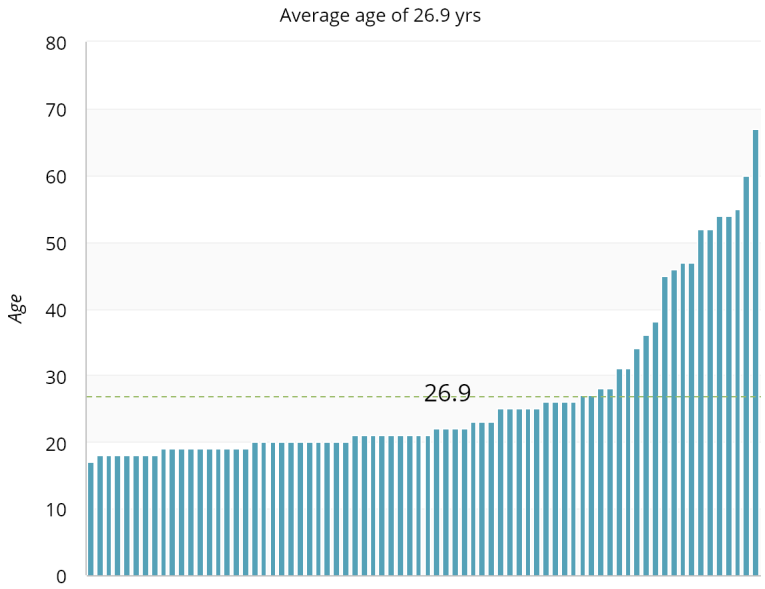


FIGURE 3. MAKERMATIC STUDENT AGE DISTRIBUTION

PILOT PROGRAM ASSESSMENT

To help assess the impact of the Makermatic program, several tools were deployed: surveys, journaling, and a professional evaluation. As part of the program, interns were asked to complete voluntary pre- and post-program surveys to assess changes in their skills and mindset. Additionally, each of the seven Makermatic sessions includes time for journaling and suggested prompts.

And finally, the CCC Maker team brought in a professional evaluator, who reviewed the program, read through journal entries, looked at the survey results, and interviewed four of the five lead coaches as well as four of the six business partners for further insights. The purpose of the evaluation was to capture the experience of the Makermatic program from the perspectives of those who were involved in it, including their interpretation of its meaningfulness in their lives, personally and/or professionally. The evaluator's summary report is freely available on the CCC Maker website. What follows are highlights from the evaluator's report.

INTERN PRE- AND POST-SURVEYS

Of the approximately 120 interns who participated in Makermatic, 86 of them participated in the voluntary pre- and post-surveys to rate their levels of confidence in career selection, sharing ideas, and working in teams (Figure 4). Additional questions addressed their technical, problem-solving, and communication skills.

Results were compared and tabulated as a window into the program's student impact. Interns gave high marks for Makermatic exposing them to career options, especially when compared to the confidence they indicated in their career selections. Action-oriented communication, developing solutions, and sharing ideas were also ranked high. The tight timeline constraints of the program, however, affected their ranking of collaboration and planning skills. Only their interest in starting a business showed negative results.

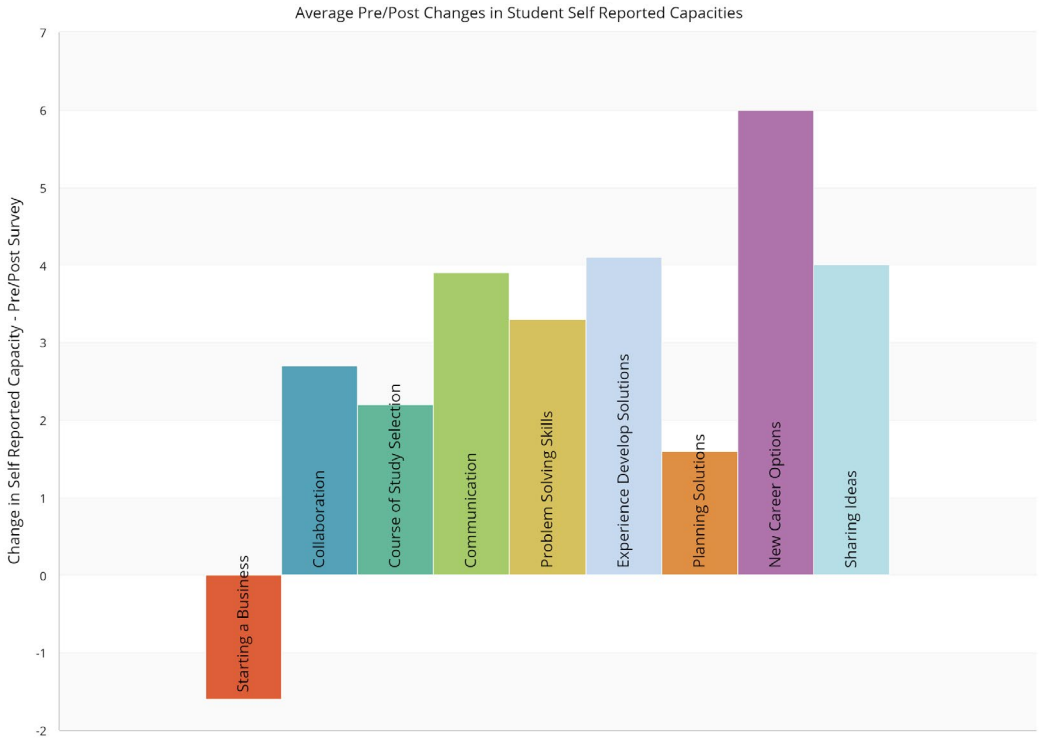


FIGURE 4. MAKERMATIC STUDENT SURVEY RESULTS

The interns were also asked to approximate the amount of time, within the 20 hours, that they spent using the skills Makermatic was meant to enhance: listening, writing, verbal communication, problem solving, and making in the makerspace (Figure 5). High marks were indicated for problem solving, verbal communication, and listening. Fewer hours were noted in solitary actions like writing and using makerspace tools.

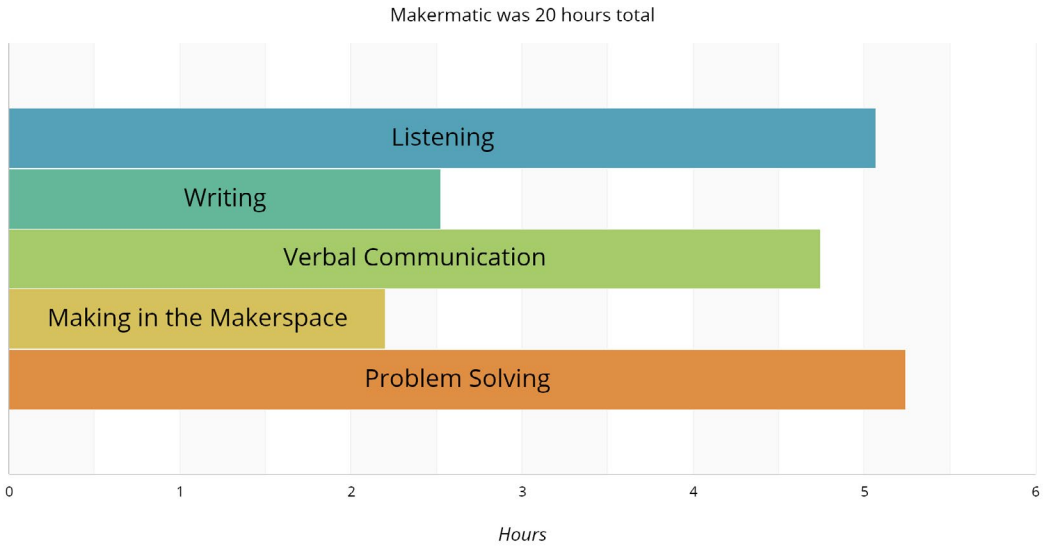


FIGURE 5. STUDENT REPORTED DISTRIBUTION OF HOURS

INTERN JOURNAL ENTRIES

Approximately half of the 120 Makermatic pilot interns submitted journal entries. Extracts from a random sample of the interns' journal entries were reviewed and summarized into four thematic categories: professional modelling, teamwork, process, and impacts. Below is a small sampling of the types of comments students submitted representing these themes.

Professional Modeling:

- When I got stuck with explaining something, I would ask for help from group members, which was helpful. We were able to build off the last statement we wrote.
- I've never met a group of individuals who were so ambitious in problem solving. That really left a great impression to be surrounded by students who rose to the occasion.

Teamwork:

- We were able to advocate for our ideas in an effective manner.
- I'm amazed at what has been coming together as we listen to the other groups and talk about their design process.

Process:

- I learned to work with others. Yes, at times it was difficult dealing with leadership roles when everyone on my team had a strong personality and were opinionated. We all learned to really listen and back down when it was appropriate and to respect one another. We've all learned to work with others, but Makermatic really put it to the test. Applying this in a real-world challenge was a true learning experience.
- Makermatic pushed me to think deeper and be more open minded when listening to others. The coaches and teammates really made a big impact when having open discussions.

Impact on Learning:

- I learned that my opinion matters too. I tend to let others decide for me, but I need to speak up if I want my ideas to be heard. Also, I learned that people think differently and have good ideas too. My team encouraged me to talk, which if they didn't, I probably would not talk much. I also found it very cool to work with real business leaders. Not many get to do that.
- The Makermatic experience really allowed me to see all of my strengths and weaknesses when working with a team in a professional environment. Now I will move forward by working on the weaknesses I saw in myself during the project, and feeling confident and motivated to further develop my strengths.

INTERVIEWS WITH BUSINESS LEADERS AND COACHES

Feedback from the four business partners interviewed was generally positive and provides valuable insight on the potential for college-business partnerships to impact students' employability. In addition to gaining fresh ideas on new business approaches, they indicated a desire to participate in future team internships. Below is a sampling of paraphrased comments that the business leaders made during interviews with the program evaluator.

- The interns had such great ideas that we took some of them to upper management during the internship and implemented them in current activities. We also did a presentation to the State Fair board about the Makermatic program. *—CA State Fair*
- The interns presented meaningful solutions and I was glad to get the perspectives of young people. *—Calfee Design*
- I appreciated being being part of the experience of having 15 minds looking at ideas to improve my business. *—Keys 2 the Coast*
- It enabled the architectural team to get input directly from the end users of the future facility. *—AP Architects*

Feedback was also obtained from five of the lead coaches, whose regular functions at their respective colleges were varied: Computer Information Systems faculty, Graphic Design faculty and business owner, dean of Visual and Performing Arts, business outreach specialist, and internship coordinator. Below is a sampling of their paraphrased comments.

- An important learning from this was seeing how flexible the students are capable of being, especially when faced with challenges. I saw growth in their soft skills and especially noted that the re-entry student who initially felt out of place gained in self-confidence. —*Folsom Lake College*
- The interns were very excited about the work they did, which they felt was quite meaningful in that it connected them in a significant way to the development of the college. They especially appreciated being part of facilitating others' growth through the experience of handling a real-world problem. —*Sierra College*
- Interns commented that the experience showed them what was possible in determining their future goals. It was awe inspiring to me to see that in such a short period of time an activity can have such an impact on their future. They have the tools necessary to forge the future in any industry they choose to pursue. —*Allan Hancock College*
- Having done Makermatic twice, it was amazing to see how different each experience was because of different interns and business partners. —*Sacramento City College*
- The college has committed to continue the internships with Strong Workforce funds and Makermatic will become the model used by the college. —*Cabrillo College*

DISCUSSION

As stated at the beginning of this publication, the Makermatic team internship program was developed in response to the suggestion, made by the CCC Maker Advisory Committee, that the potential of the community college student was under-imaged and the business community had real business problems that they would gladly share with students as topics for learning and a source of creative solutions. These hypotheses were put to the test in the pilot implementations of Makermatic, whose results are presented in the evaluator's summary report.

The evaluator writes, "Just as Makermatic was developed in the spirit of true makerspace experimentation, so was its evaluation, as it was more important to capture the essence of what happened than to establish facts. While far from a scientific evaluation, valuable insight can nevertheless be gleaned from the participants' comments on their experiences of the program. The following discussion addresses some of the questions that the CCC Maker team initially grappled with in designing the program." What follows is the verbatim discussion analysis of the pilot results, as it appears in the evaluator's report.

Would the students and businesses find it appealing to engage in a mentored internship in a makerspace environment?

We can say unequivocally that the interns did indeed find the experience not only appealing, but in some cases, the most rewarding learning experience of their time in college to date. An aspect of the experience that was especially meaningful to them was working with peers across multiple disciplines and, for the first time, realizing the value of learning from vastly different perspectives and approaches.

Makerspaces are meant for this type of interdisciplinary project, whether or not they use the type of equipment typically found in makerspaces. Some of the Makermatic interns had not been in the college's makerspace before the internship—on average only six hours— but were glad to discover it and intended to continue utilizing the space.

On the other hand, the sample of business partners was too small to definitively address this question. In one case, the answer was absolutely yes as his previous use of the makerspace for some of his company's work is what motivated him to participate in Makermatic. Two of the business partners were motivated by the opportunity to work with multiple interns at one time and to gain insight about their business from multiple perspectives outside their work environments.

Is the program scalable, meaning onboarding multiple students in one internship instead of seeking one internship for one student at a time?

The coaches reported that the process of recruiting and hiring multiple interns at one time was a challenge, especially as it needed to be done quickly given the short timeframe of the project. The idea of pairing one business partner with multiple interns to work on a single challenge has merit in theory, but its practical application might benefit from further examination and testing of approaches to getting it done. One

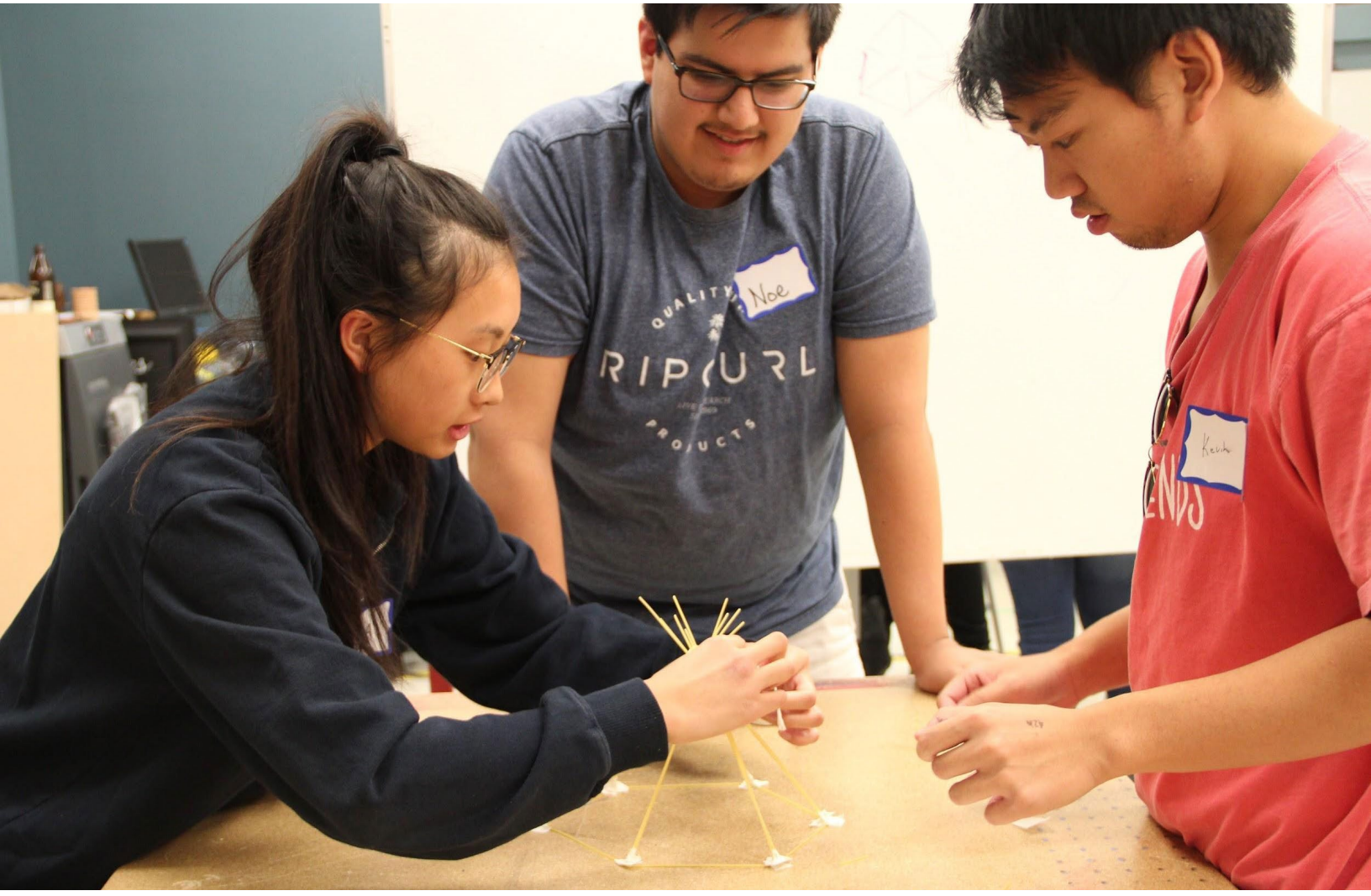
college used an outside job development agency with systems in place to manage the process effectively and will continue to do so for all of its internship placements.

Did the program demonstrate a positive impact on the students, the college makerspace, and the contributing businesses?

The business leaders reported that at least some of the ideas and solutions were valuable and worthy of implementing in their businesses, which they did. That there was benefit to them was also indicated by the fact that most said they would participate in Makermatic again if it is repeated.

Whether there was an impact on the college makerspace as a facility was not directly examined, but the experience of holding Makermatic in the makerspace increased its visibility on campus, not only to students but to career centers as an opportunity to consider this model of internships.

The positive impact on the interns was clearly demonstrated in their self-reflections, where they spoke to what they learned. A positive impact was also demonstrated in their pre- and post-survey responses, where increases in rated capacities were



indicated in eight of the nine categories. Therefore, an assumption can be made that the Makermatic model met its objective of enhancing the "soft skills" needed to succeed in a modern workplace. However, the category, starting a business, indicated a decrease in rating.

A premise of the makerspace ecosystem is that they are places for creativity and innovation, the sparks for new business ideas. However, instead of thinking only of new business creation, Makermatic might consider addressing the creativity and innovation needed within a work environment, or *intrapreneurism*, to help students better understand the application of these skills as being of value as an employee.

Did the business leader gain new insights that made the time invested cost effective and meaningful to furthering business goals?

The data indicates that the business partners did gain new insights from the ideas and solutions the interns presented to them. While one business partner enthusiastically attended all the sessions, one attended only one session and the others participated as suggested in the curriculum. Only one mentioned that the investment of his time could have been better spent. These differences may say more about individual personality and/or demands of the business than about the Makermatic model. However, the fact that at least three of the business partners actually hired interns indicates that something significant worked in Makermatic.

GOING FURTHER

While the CCC Maker team developed the Makermatic program in response to a suggestion by the CCC Maker Advisory Committee, sharing specific details of the program in the *Makermatic Workbook for Coaches* as well as this program overview publication is done in the spirit of the knowledge sharing that is inherent in the Maker Movement. The hope is that sharing these details and insights can help other colleges and makerspaces in adopting some variety of Makermatic or using it as a springboard to develop a team internship program that best suits their community. This publication is part of an ongoing conversation, and we invite you to add your voice and perspective.