Message from the School of Dentistry Dean

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OHSU School of Dentistry Anthology senior editor

Welcome to the third issue of the OHSU School of Dentistry Anthology, or SoDA. This edition focuses on innovation and features articles authored by students showcasing their innovation at the school.

Innovation is a crucial mindset for dental students to cultivate and apply. The dental curriculum is often dense and highly structured, creating barriers to creative and innovative thinking. However, dental students must develop skills in identifying problems or gaps, brainstorming potential solutions, assessing feasibility, and presenting their ideas. These skills are nurtured through activities like "hackathons," giving students the chance to work together in a fast-paced, fun setting outside of the classroom. Such skills are valuable in clinical practice and in our personal lives.

In addition to hackathons, this edition of SoDA highlights other student-driven programs such as Voices in Inclusion, Belonging, and Equity, or VIBE, and the Bridges Collaborative Care Clinic, which includes the Bridges Dental Clinic.

VIBE was established in response to a need expressed by students to learn about and celebrate cultural events. The student-led club offers multicultural learning opportunities and activities, often centered around food, and welcomes participants from the school and community.

Bridges Dental was founded about three years ago when our students recognized a critical gap in oral health services for the homeless population in Portland, Oregon. It complements other health care services provided by OHSU students. As detailed in an article in this edition, Bridges Dental is governed and managed by students, with support from faculty, staff and industry partners.

The programs described in this issue result from innovative thinking by students who identified needs, brainstormed potential solutions, tested pilots or prototypes, and refined them to create sustainable solutions.

I have also included an article on innovation and creativity, based on a course I taught within the OHSU-Portland State University Healthcare MBA program. In it, there are observations, innovative mindsets and tools that can be applied to dental and other health care areas.

Thank you to the editorial team at SoDA: Rhonda Morin, APR, M.L.S., Samyia Chaudhry, D.M.D. '17, Christina Truong, D.M.D. '19 and Pam Pierce, M.L.S., M.S., at the OHSU Library, for their contributions and support in publishing this anthology.

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Rapid cycle innovation at the OHSU School of Dentistry

"Hackathons" give students opportunities to explore their talents as problem solvers
Ronald Sakaguchi, D.D.S., M.S., Ph.D., M.B.A., and Robby Bergstrom '25

"Hackathons" have been conducted around the world for more than 20 years to quickly develop new product and service concepts. The term hackathon comes from the words hack and marathon. It describes a process of rapid cycle innovation that brings teams of people together to race against the clock to create improvements, ideas and solutions. Hackathons can be as short as a few hours or can last several days, as opposed to a typical design, prototyping and manufacturing process that can take weeks, months or years.

Hackathons at the OHSU School of Dentistry bring students together to brainstorm and test ideas. Hackathons invite a different way of thinking in a traditional dental curriculum that is structured and dense with little time for explorations in creativity and innovation. They encourage students to selectively forget about conventional approaches and assumptions to open the mind to new and nontraditional ideas. Wild ideas are encouraged to spark other ideas from the team. Premature judgment of ideas, which can stifle innovation, is suspended to allow a free flow of many ideas.

Hackathons in the OHSU School of Dentistry have thus far been limited to students. The sessions are facilitated by the dean, while staff and faculty members join in to encourage creative and innovative thinking.

Process

Hackathons have predefined themes. The goal of the first hackathon was to create products and processes that promoted environmental sustainability in our clinics by reducing plastic and paper waste. Another one focused on devices to improve the delivery of care. Other hackathons promoted improvements to the dental curriculum for third- and fourth-year students, and then finally, the first- and second-year curriculum. Members from different class years are invited depending on the theme.

Students volunteer for the event and aggregate in teams of four to five each at the start. The team creates a name for itself. Each team member is given a role: timekeeper, project coordinator to keep the team focused, runner to get materials and ask questions from the team, scribe to take notes, and provocateur to challenge assumptions and suggest other approaches.

Abstract

A group competition—called a "hackathon"—is a rapid cycle invention workshop intended to spark innovative ideas while giving participants the chance to work together in a fun setting. Hackathons originated from marathon programming sessions by software developers, according to one such event that occurred in June 1999 in Calgary, Canada. The OHSU School of Dentistry conducts hackathons with students to give them an opportunity to be creative and innovative problem solvers. They work in teams to identify a problem, develop solutions and prototypes from office materials and pitch concepts to judges in a matter of a few hours.

Defining the problem

The process starts with a definition of the problem or need. If the problem or need isn't clear, it is hard to focus on appropriate solutions. The team is asked, "What is the problem you will solve? Why is this important?" Fifteen minutes are allocated to this step.

Brainstorming radical concepts

Next are options or possible solutions. In this step, teams are encouraged to use their problem definition to prompt a variety of possible solutions. The goal is to define more than 50 options. Wild and crazy proposals are welcome because they often spark other ideas. The team is asked, "What are possible options?" There are no bad ideas and team members are instructed to withhold judgment and refrain from saying, "That won't work." This step is often called the divergence phase because thinking should be broad and creative. Twenty minutes are allocated to this step.

Every team member should suggest 10-12 ideas. Three-inch by three-inch sticky notes work well for this activity because ideas can be easily summarized on the note and posted on poster-sized paper on the wall for all to see and use as a springboard for other ideas. If the volume of ideas lags, offering prompts such as business logos can help recharge and re-energize the team. For example, prompts such as, "How would Amazon or Nike or Columbia Sportswear solve this?" Questions like these usually promote a flood of ideas.

Consolidating solutions

The solutions step is often difficult for the team because the abrupt change from free-flowing ideation to critical analysis and decisions. Here we take the 50 or so ideas and narrow them to one or two that have the most promise for viability and feasibility. This is a convergence phase. The team is asked, "What is the product or service that will solve the problem?" Similar ideas on small sticky notes are clustered together and duplicates are removed. The problem definition is reviewed, and solutions are tested for their ability to solve the problem. The team evaluates if the solution is possible to build and implement (feasibility). If the solution requires research and a new discovery, it is thrown out. They also determine if the solution is affordable (viability) and of interest to the customer or user (desirability). Students perform a quick internet search to check if the solution is readily available for purchase. This would also be a dealbreaker.

Robby Bergstrom '25 works with his group during a hackathon exercise in February 2024. *Photo by School of Dentistry*

Students brainstorm a range of solutions to a problem during a February 2024 hackathon exercise. *Photo by School of Dentistry*

This step is also difficult because team members fall in love with their ideas and advocate strongly for them. If a few voices advocate for their ideas too strongly, the team should question the value of the idea, its relevance to the problem, and if there are better ways to solve the problem. The team has twenty-five minutes to complete this step.

Building a preliminary model

If the energy in the room declines in the final minutes of the solution phase, it will rise again when prototypes are built. This is the fun stage. Using stationery supplies and materials such as straws, tongue depressors, paper plates, aluminum foil, string, hot melt glue and pipe cleaners, teams create physical prototypes of their final solution. Prototypes help to communicate the concept and show how it works. If the solution is a process, teams develop role plays or animations of the process.

In one hackathon, a team modeled a dental delivery cart with handpieces and suction out of cardboard, rope, foil and rubber bands. Another demonstrated a novel tooth vitality device out of similar materials. These prototypes are rough and ready mockups that demonstrate how the concept works to help visualize the idea. It's helpful to see how a device works and to touch and play with it to get an understanding of the concept. This segment is allocated twenty minutes.

Pitching a solution

Using their prototypes, teams create a five-minute pitch to present their solution to the judges, answering the questions, "What is the problem? What is the solution? How does it work? Is it feasible? What is the value or improvement?" and "What would it take to implement?" The most successful teams involve all team members and use role play or a skit to present their solution. Thirty-five minutes is given to develop the pitch.

The pitch is presented to a four- or five-member panel of reviewers or judges, who are knowledgeable about the problem. The School of Dentistry includes faculty, alumni and business partners in its judging panels. The panel receives a list of criteria and weights for scoring. Teams are scored on teamwork, problem definition, solution and presentation.

Left to right, Becca Forshaw '24, Christopher Elkhal '24 and Alex Wong '25, create their presentation during a June 2023 School of Dentistry hackathon. *Photo by School of Dentistry*
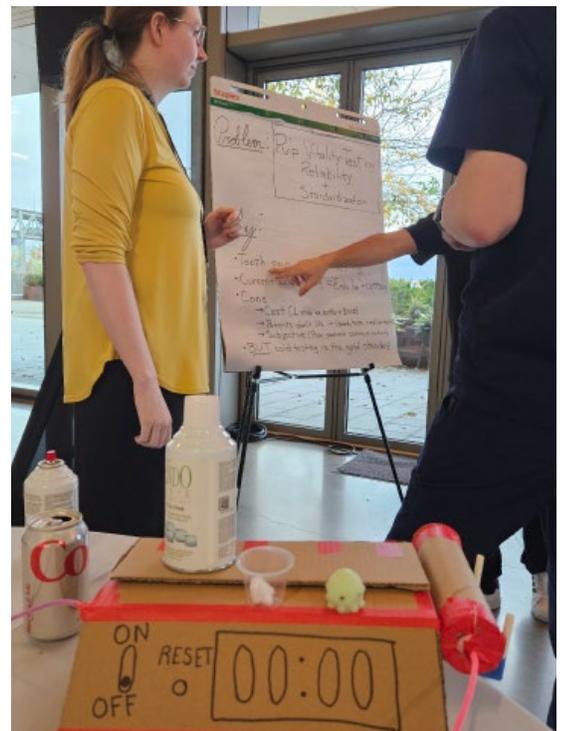
School of Dentistry student Becca Forshaw '24 and her group practice their hackathon pitch with their prototype for pulp vitality testing in the foreground during a December 2023 exercise. *Photo by School of Dentistry*

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The criteria are:

- **Team dynamics.** Did everyone participate in the project? Was the team respectful and collaborative?
- **Problem.** Was the problem concise and easy to understand? Was the problem important?
- **Solution.** Was the solution concise and easy to understand? Was it feasible? Was the value or improvement clear?
- **Presentation.** Did the pitch stay within five minutes? Was the presentation creative and well-rehearsed? How did the team do in the question-and-answer period?

Reviewing feedback

For every pitch, reviewers score the team's work and note key points for feedback. The review team huddles and ranks the teams. The teams reconvene to receive feedback from the review team and receive awards for their work.

Faculty and the administrative leadership team are invited to the final presentations to take notes and consider ideas to put into practice. For example, as a result of a 2023 hackathon about environmental sustainability, a school-wide clinical sustainability committee was formed, composed of students, dental assistants, the infection control director and faculty.

Other ideas included reusable air/water syringe covers, biodegradable bags for headrest covers, and easily cleaned keyboards without covers. A clinic device hackathon in 2024 resulted in a novel suction tip and dental delivery system. Curriculum hackathons in 2024 identified areas in the curriculum that were redundant or mis-sequenced.

Industry partners who served as judges noted how they wished their dental education had included events like hackathons to promote innovation and creative thinking.

Encouraging entrepreneurs

Students are excited to work in the hackathon environment, which is radically different than their traditional studies. A group of students even created a university-recognized innovation club to expand their learning and exposure in creative and innovative thinking, design and fabrication.

CRITERIA	WEIGHT	SCORE (1-5)
Team dynamics. Did everyone participate on the project? Was the team respectful and collaborative?	4	
Problem. Was the problem concise and easy to understand? Was the problem relevant?	4	
Solution. Was the solution concise and easy to understand? Was it feasible? Was it clear how it would solve the problem?	6	
Pitch. Did the pitch stay within 5 minutes? Was the presentation creative and well-rehearsed? Did the team answer to questions clearly and concisely?	6	

Hackathon diagram criteria-weight-score, 2023-2024.
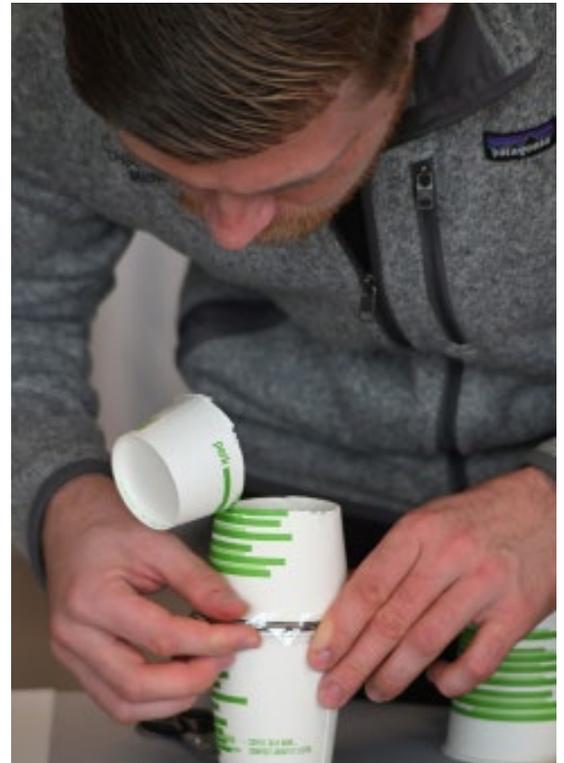*Graphic by School of Dentistry*

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Students agree that the hackathons are positive and lead to unexpected benefits. Besides encouraging an entrepreneurial mindset for their future in dentistry, students reported a deeper understanding of the challenges faced by the OHSU School of Dentistry leadership in the educational process and a deeper sense of engagement.

"We asked questions and received answers while we were tasked with finding solutions during the activities. We came to understand OHSU at a deeper level. Many assumptions were tested and honed while we worked in a collaborative environment. I appreciated the engagement," said Robby Bergstrom '25, a hackathon participant.

Conclusion

Innovation and creativity are the foundation of any successful industry in building a better future. Hackathons have proven to be an effective way of sparking innovative ideas with diverse people collaborating as a team to develop solutions to problems. The School of Dentistry hackathons have encouraged dental students to be creative in their thinking while finding solutions. The process takes it a step further by actively implementing some of the ideas. Several of the ideas originating from the hackathons have improved operations at the School of Dentistry. The sense of satisfaction and growth students have shown while being part of these hackathons is ineffable. Activities such as these are effective in dental education early on to help students learn team building skills, innovative thinking and problem-solving techniques so they can develop into innovative dental professionals. For this reason, hackathons at the School of Dentistry will continue to offer a platform for students to work together and evolve as oral health care professionals.

School of Dentistry students build prototypes during a December 2023 hackathon exercise. *Photos by School of Dentistry*

VIBE is a feast of inclusion

From Pass the Plate to the Lunar New Year, how a student-driven initiative is cultivating community and celebrating culture at the OHSU School of Dentistry
Kylie Carganilla '25 and Tiffany Tep '25

Have you ever peeled back the flakey goodness of a buttery baklava treat? The honey-sweetened flaky phyllo pastry dough, filled with chopped nuts, melts on your tongue. Maybe the sticky honey from the pastry coated your hands, and you couldn't help but lick the delicious flavor from your fingertips. OHSU School of Dentistry members had just this experience last April when they took part in a Voices for Inclusion, Belonging and Equity, or VIBE, event outside of a classroom in the Robertson Life Sciences Building.

VIBE is an intentional effort to celebrate diversity, inclusion and equity within the School of Dentistry. The mission is to create a culture of belonging and acceptance for individuals who feel excluded because of their race, religion, ethnicity, nationality, sexual orientation or other factors. The student group strives to be equitable in its approach, committed to listening to and addressing the concerns of its peers while providing a platform for education and cultural awareness.

Before the launch of VIBE in late 2022, some students spoke about their struggles of not feeling fully connected with the school community. Despite the diverse makeup of the student body, there was a noticeable lack of education and awareness about minority groups. Some students felt isolated and misunderstood.

A group of motivated dental students brainstormed a way to bring joy and a range of experiences into the academic community. VIBE was created with the help of supervising faculty member Lenore Supnet, D.M.D., and School of Dentistry Dean Ron Sakaguchi, D.D.S., M.S., Ph.D., M.B.A.

"As a group leader, I have students coming in and out of my office all the time. At the time, I had some students who were from marginalized backgrounds who felt like they couldn't relate to certain faculty and staff... Because they can't relate, these students are at a disadvantage and are unable to network and form connections in the dental community," said Supnet.

Abstract

Voices for Inclusion, Belonging, and Equity, or VIBE, is a student-led group that celebrates diversity, inclusion and equity within the OHSU School of Dentistry. Since it was formed in 2022, it has strived to create a culture of belonging and acceptance for individuals who feel excluded because of their race, religion, ethnicity, nationality, sexual orientation or other factors. The student group is committed to listening to and addressing the concerns of its peers while providing a platform for education and cultural awareness.

Lunar year start

VIBE's first co-president and recent graduate Ali Sultan, D.M.D. '24, was passionate about helping his peers feel supported.

"For many underrepresented groups, community and representation wasn't just a privilege, but an integral part of our success as students. With strong representation, we can advocate for ourselves and mentor future generations of students," said Sultan.

The vision is to offer an inclusive and safe environment where students come together, share their experiences and support one another during the rigorous dental program.

In February 2023, VIBE hosted its first event: a small gathering to educate students about the Lunar New Year. This lunchtime function included a cultural presentation, games and the sharing of red envelopes. The envelopes are a goodwill gesture, often filled with money, to signify prosperity for the new year. The enthusiastic celebration gave students and OHSU employees a chance to learn about the cultures of Asian American students and dental patients.

"Coming from a Vietnamese background where my family celebrates Lunar New Year every year, it was exciting to see my culture represented and to watch others learn about it. The following year, as I took on the role of events chair, asI was inspired to share my own experiences with Lunar New Year," said Valerie Thai '25, a VIBE events chair member.

Pass the Plate

VIBE's commitment to inclusivity continued with their first Pass the Plate function in April 2023 honoring Arab American Heritage Month, where there were sample Arab dishes from various local Portland restaurants.

The next Pass the Plate event occurred less than four months later, highlighting Hawaiian, Mexican, Filipino and Vietnamese cuisines. Students and employees savored flavors from every corner of the globe. Pass the Plate quickly became the club's most popular event.

These types of events aim to nourish the heart and body while encouraging a greater appreciation and understanding of cultures beyond one's own.

Red envelopes and a fruit basket were on display during a celebration of Lunar New Year on January 24, 2023. *Photo by School of Dentistry*

Left to right, an employee from Hoda's Middle Eastern Cuisine restaurant, School of Dentistry students Jossy Piedra-Rodrigues '25, Kylie Carganilla '25, Nawal Karam '25, Katherine Ouda '26, Tiffany Tep '25 and Abubeker Mohammednur '25 offer baklava during a 2024 VIBE event. *Photo by School of Dentistry*

VIBE offers an array of monthly entertainment and educational events to create community and connection, such as:

- Women in dentistry panel
- School of Dentistry faculty speaker for Native American Heritage Month
- Community outreach at a local elementary school
- Boba at lunch
- Baklava and tea

In May 2024, Dean Ron Sakaguchi offered his personal story at an Asian American and Pacific Islander Heritage Month event, hosted by VIBE.

"I was honored to share the stories of my grandparents as immigrants ... I attempted to be open, honest and authentic in my stories, hoping to educate and build relations with students, staff and faculty who might not be aware of the Japanese-American experience during World War II or have had similar experiences in their life," said Sakaguchi.

These diverse activities celebrate cultural heritage and encourage students to explore new perspectives. By regularly offering engaging experiences from a wide selection of topics, all students can benefit from a sense of belonging and home throughout the year.

Exciting next steps

As VIBE concludes its second year, the students who run the group remain excited about enhancing its most popular initiatives, launching new projects and continuing to cultivate a welcoming environment for all. They are committed to growth and inclusivity.

Looking ahead, VIBE will expand its mentorship and outreach efforts by launching a mentor initiative and working closely with undergraduate programs and local dental organizations.

The club also plans to broaden its educational mission by covering new topics relevant to diversity, equity and inclusion in dental practice with frequent presentations by OHSU faculty members.

They aim to enhance community outreach by partnering with organizations outside of OHSU to bring in diverse perspectives and resources.

New scholarship

VIBE launched a scholarship in 2024 to recognize and support first-year students with experience in promoting diversity within their schools or communities. The Loupe Scholarship provides financial assistance to incoming students committed to fostering belonging and equity among OHSU members and the regional dental community.

"VIBE created a home for students to learn and share experiences from their broad range of backgrounds and cultures. VIBE has brought together students, staff and faculty to celebrate cultures and traditions," said School of Dentistry Dean Ron Sakaguchi, D.D.S., M.S., Ph.D., M.B.A.

The long-term strategy is to broaden VIBE's reach across the country by establishing chapters at other dental schools. By doing this, opportunities for new partnerships and innovative approaches will arise.

During an end of the year VIBE celebration on July 13, 2023, a new VIBE student leadership team was welcomed. Back, left to right: Christopher Elkhan '24, Jackson Van '24, Ali Sultan '24, Ali Saad '25, Dean Ron Sakaguchi, D.D.S., M.S., Ph.D., M.B.A., Katherine Ouda '26 and Joelle Hakoum '26. Middle: Kylie Carganilla '25, Lenore Supnet, D.M.D., Valerie Thai '25 and Tiffany Tep '25. Bottom: Merit Roshdy '24, Marina Youssef '24 and Karly Gushiken '25. *Photo by School of Dentistry*

Bridging smiles and services: dental students bring compassionate care to Oregon's underserved

Bridges Dental Clinic is student operated and one they take great pride in

Anna Ball '25, Angela Hung '26, Crystal Ly '26, Thomas Rezendez '25 and Whitney Warth '26

In the aftermath of the COVID-19 pandemic shutdowns, OHSU dental students Ellie Amico, D.M.D. '24, Ciara Robinson, D.M.D '24 and Tyler Gimenez, D.M.D. '23 had a vision to build an entirely student-run dental clinic based in the epicenter of Portland's homeless crisis, serving the most vulnerable population in Oregon free of charge.

When they began the work, they found a storage closet with a hodge podge of instruments. There were also a few antiquated portable compressed air units used for dental procedures, and a heavy dental chair among other mismatched dental equipment that had been collected by previous students over the years.

Fast forward to February 2022, and the first dental clinic at **Bridges Collaborative Care Clinic** opened to provide simple cleanings for patients. Under the guidance of OHSU School of Dentistry faculty member Michele Pindyck, D.M.D., the trio of students were on their way to caring for an underserved group in Portland. OHSU School of Dentistry division head of Dental Public Health, Lyndie Foster Page, Ph.D., B.D.S, also advises and supports the students.

Since then, OHSU dental students have continued to expand the dental services at the clinic—seeing about 60 patients each quarter. By the 2023-2024 academic year, the group had provided $36,000 in free dental care.

Today, the dental clinic is managed by student co-chairs Angela Hung '26, Whitney Warth '26 and Crystal Ly '26, who followed in the footsteps of their peers, Anna Ball '25 and Thomas Rezendes '25. A team of eight other dental students volunteer their time to promote, develop and assist in the clinic's function.

Mission driven

The mission of the dental branch of the **Bridges Collaborative Care Clinic** is to provide accessible oral health care to vulnerable and underserved populations in the community. Patients access urgent health care during walk-in appointments, including dental care. Beyond providing routine

Abstract

Bridges Dental is a student-run, interprofessional, free clinic providing resources to vulnerable and underserved communities, while promoting public health. It started in 2022, when it joined Bridges Collaborative Care Clinic in Portland, Oregon. OHSU School of Dentistry students team up with their health care provider peers to promote and improve the overall health of Oregonians. The clinic cares for about 60 patients each quarter. Students are supervised by School of Dentistry faculty and practicing dentists. By the 2023-2024 academic year, the group had provided $36,000 in free dental care.

dental care services, the clinic helps patients access and oral health care. For example, Bridges Dental directly refers patients to OHSU's Russell Street Dental Clinic and other local community health clinics such as Multnomah County Health clinics.

Bridges Dental also collaborates with Transitions Projects, an organization supporting Portland's homeless population by providing housing and other resources.

Learning opportunities

Student volunteers offer cleanings and exams, procedures for replacing or repairing damaged or missing teeth and simple extractions. Functioning similarly to the model at the OHSU School of Dentistry, students provide care under the supervision of licensed dentists. Many of the supervisors are OHSU dental faculty, while others are practicing dentists in the local community.

Volunteer activities are open to all dental students at any level of clinical experience. For example, first- and second-year dental students can provide patient care like oral health instructions. In all cases they are supervised and mentored by licensed professionals.

"The first dental cleaning I ever did was at Bridges. It helped me feel a lot more confident about my hand skills going into my clinical years and having an overall feel of what patient care is like," said Caroline Hoang '26.

Along with opportunities to gain hands-on clinical experiences early in their professional education, Bridges Dental helps future clinicians become familiar with diverse populations who have complex needs, both socioeconomically and medically.

"My experiences volunteering at Bridges Collaborative Care Clinic have shown me the power of giving back to the local community and donating your knowledge and expertise in your respective field. Patients express gratitude for the care we provide and are grateful they have somewhere to seek dental care. I've had the pleasure of seeing some patients multiple times. Seeing the difference we made in their lives firsthand has been a deeply moving experience for everyone involved," said Jack Klar '26.

Angela Hung '26 and Michele Pindyck, D.M.D., clinic director of Russell Street Dental Clinic, care for a patient at Bridges Dental Clinic in Portland, Oregon, in 2024.
Photo by School of Dentistry

Dental students Angela Hung '26, Crystal Ly '26 and Whitney Warth '26 are the student leaders for Bridges Dental Clinic in 2024. *Photo by Michael Lacey, D.M.D.*

Student run

The Bridges Dental Clinic provides unique educational opportunities for dental students at the School of Dentistry. By volunteering, students take initiative in their professional development. The student co-chairs are responsible for the clinic's operations, such as ordering supplies, budgeting and staffing. The co-chairs also manage a leadership team that supports the daily operations such as sterilizing equipment and maintaining patient records.

"Being a co-chair has given me the experience of running a small-scale dental clinic. I'm very grateful because most dental students don't get to learn these business skills while they are still in school," said Anna Ball '27.

Promising results

Community members have greatly benefited from having access to the Bridges Dental Clinic. The number of patients getting care has steadily increased. In one year, the number of patients went from 170 to 216. The numbers continue to rise as the student leaders expand their outreach efforts to community partners and underserved populations in Portland.

The revenue has seen a similar trend, with an increase to $36,000 in 2023-24 (Fig 1). All dental services are provided free to patients, further demonstrating the immense impact this clinic is having by providing accessible oral health care.

Dmitri Aleksandrov, D.M.D., assistant professor at the OHSU School of Dentistry, monitors dental students as they provide oral health care at the Bridges Dental Clinic in the summer of 2024. Photo by School of Dentistry
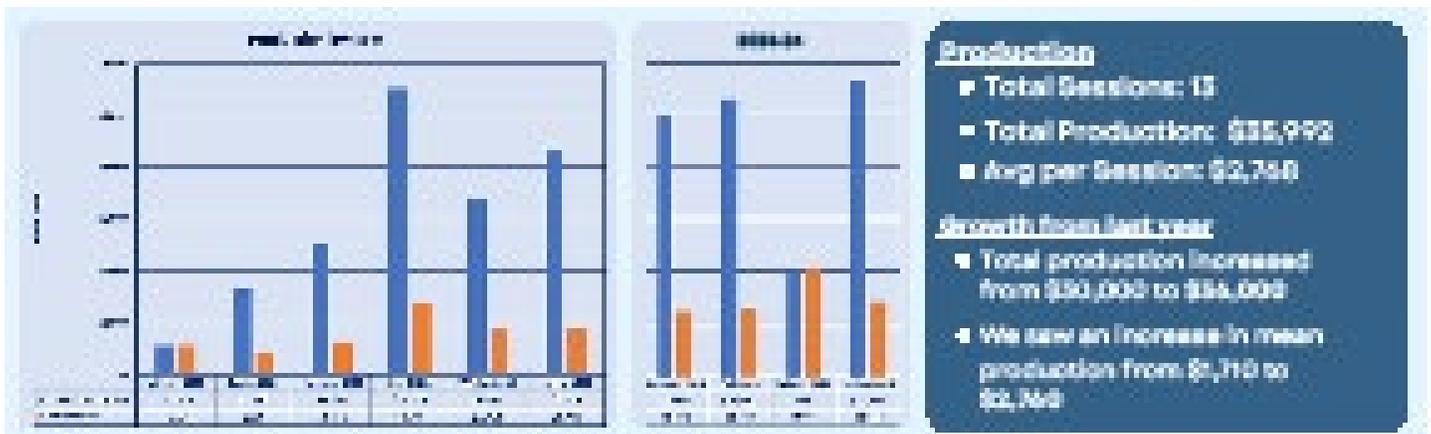

Fig 1. The estimated production and growth from 2022 to 2024, at the Bridges Dental Clinic. Graphic by Bridges Dental Clinic

The future

The students who serve the dental clinic are looking eagerly toward the future as more opportunities with partners and grants have opened doors to expand the clinic and provide care for more patients. There are currently three operatory chairs and one hygiene chair.

The students intend to:

- Expand to six fully functional mobile units at the downtown Portland location. A collaboration with **A-dec Inc**., for equipment is making this possible.
- Continually collect data to capture the outcomes of how the care model affects patients and clinical education.
- Engage with social work and public health students to increase interprofessional collaborations.

Essential partnerships

The Bridges Dental Clinic is one of several branches that the **Bridges Collaborative Care Clinic** operates. Bridges Collaborative Care Clinic was Oregon's first multidisciplinary free clinic when it was established in 2017 as a 503(c)(3) nonprofit organization. The mission is to offer low-barrier, participant-centered care and services in the Portland metro area through an interprofessional, student-led clinic.

Academic partnerships with Portland State University, OHSU nursing, medical, dental and Oregon State University's pharmacy programs allow Bridges Collaborative Care Clinic to operate free clinics throughout the Portland area. A wound care clinic with the OHSU School of Nursing serves people in the Old Town neighborhood of Portland.

A comprehensive and evolving medical clinic offers weekly urgent and specialty care in sexual reproductive health and dermatology with other efforts underway for ophthalmology. Partnerships with OHSU's medical and specialty programs make these clinics possible.

A newly reinstated mobile vaccination clinic with the Oregon State University Pharmacy program and the OHSU School of Medicine is expected to open in 2025.

Each of these clinics complements the work of the Bridges Dental Clinic and allows for even more opportunities for interdisciplinary care.

Conclusion

The Bridges Dental Clinic has come a long way since the clinic opened following the pandemic. However, it has remained steadfast in its original intent: to be a student-run, interprofessional, free clinic providing resources and promoting public health to underserved communities in the Portland area.

Together, dental students, their medical peers and OHSU faculty are helping to improve the health of all Oregonians.

Innovation through human-centered design and collaboration

Diversity of life experiences, thinking, opinions and perspectives result in better discussions, brainstorming and solutions

Ron Sakaguchi, D.D.S., M.S., Ph.D., M.B.A.

Swiss electrical engineer Georges de Mestral was hiking in the mountains of Switzerland in 1941 when he noticed the way cockleburs stuck to his pants and his dog's fur. This observation led to an idea. Returning to his shop, de Mestral engineered and implemented a system that mimicked the hook and loop features of the cockleburs, fabrics and animal fur. It was the start of VELCRO® Brand of products.[1]

Creativity (idea) + implementation (action) = innovation.

The word, innovation, appears in grant proposals, product descriptions, résumés, job titles, department names, conferences, marketing and advertising. Companies say they want to innovate. People say they want to be an innovator. But can we agree on a common definition?

Innovators who come to mind are Phil Knight, Steve Jobs, Diane von Furstenburg, the Wright Brothers, Grace Hopper, Thomas Edison or Marie Curie. But there are also lesser-known innovators who developed products we use every day—perforated toilet paper, sticky notes, windshield wipers and pencils. These innovators and inventors saw a need or gap and filled them with products that became ubiquitous.

In some cases, innovators create something completely new, but most of the time they combine a few existing things in a novel way or mimic what they see around them. Few would have guessed 25 years ago that the idea of merging a camera with a phone would result in a product we use all the time.

Think 1 + 1 = 3.

Human-centered design

Innovation differs from process improvement. Both are important, but innovation focuses on creating new value for the customer and innovator. For example, moving a printer closer to where the work is done reduces steps and time, which is an improvement, but not innovative. It's not new. Removing the need to print anything altogether would be innovative.

Abstract

Innovation creates new value for the customer and the innovator. Human-centered design and innovation focuses on people—the customer or user. Through observation and curiosity, problems and opportunities are identified that can benefit from something new. Observations and interviews in the workplace reveal gaps and workarounds that are ready for creative and novel solutions. Innovation results when implementation is applied to creativity to take the novel idea into reality and use.

The first step in innovation is observing and being curious. Innovation doesn't happen if we're satisfied with things the way they are. Innovation happens when we're curious about why things are done a particular way and why and how people work around apparent obstacles. Through observation and analysis, we identify problems and opportunities that can benefit from something new.

This requires patience, humility, empathy and time. We don't start with solutions. We start by putting ourselves in the place of others, observing their workflow, empathizing with how they feel and documenting it.

This type of innovation is called human-centered design or innovation. Solutions in human-centered design focus on the customer or user—people. We go to where they work or receive services, then we observe and study what they do. We then propose potential solutions, listen to their comments and watch how they use them.

We develop relationships with the people who use the solutions and with the people who will implement them. Consumers and humans want to be heard, involved and valued. The best solutions welcome collaboration with customers and implementers.

Improved outcomes

Collaboration shares control of the solution and situation with the customer or user. When we engage with users better outcomes result. For example, when patients are engaged in scheduling their appointment times, no-shows drop dramatically. When patients are in control of the diagnostic mammography imaging process, they report less discomfort. They are also more apt to apply greater pressure on the imaging surface during the procedure, resulting in clearer images. By including the customer in the solution, better outcomes occur.

When creating innovation teams, diversity in life experiences, thinking, opinions and perspectives result in better discussion, brainstorming and solutions. We should always ask, "What are we missing? What are other ways to think about this?"

When we reach a consensus too quickly, we should question our assumptions and biases, and then reset the conversation.

Why then are we not more collaborative?

Sometimes, as problem solvers, innovators rush to find solutions and push the solution on the customer. It is important to fully understand the problem before getting started. It is also important to remember the reason for the change or innovation in the first place: the why.

Get in sync

For example, while doing a clinic improvement sprint, one clinic noted they were continually short of sterilized instruments. This resulted in longer wait times for patients and frustration for providers and staff. Jumping to solutions, the clinic framed the problem—not enough instruments—as a solution: how can we budget for more instruments? But that missed the real problem. Slowing down to fully understand the problem, they studied the patient, provider, and staff experience and the journey of the instruments from clinic to sterile processing to delivery back to the clinic. In doing so, the real problem was revealed.

The clinic and sterilization schedules were out of sync. Patients were not scheduled when instruments were available. Instruments were sterilized on a first-in, first-out schedule rather than being coordinated with the clinic need for instruments, based on the patient schedule.

By coordinating schedules, the clinic found it had enough instruments. Patient wait time decreased. Provider and staff frustration diminished. Take the time to fully understand the problem before jumping to solutions. Be empathetic toward the customer or patient and their experience. This should always be the starting point for any problem-solving initiative.

Creativity + implementation = innovation

Creativity is often talked about as a predecessor to innovation, but creativity alone doesn't lead to innovation. Implementing, or acting on the idea is required.

Creativity and ideation come from being observant, seeing new combinations and patterns, or using old ideas in new ways. Creativity comes from phrases such as what if, and why not. It is about thinking differently, seeing opportunities or gaps and finding ways to fill them.

But creativity alone is not enough. As they say, ideas are a dime a dozen. Innovation results when creative ideas or concepts are implemented. Just as we use an iterative cycle to understand the problem or gap and create ideas, we use an iterative cycle called design thinking to develop, test and refine solutions for implementation. After understanding the problem or need, we identify dozens of potential ideas for solutions. We refine the number of potential solutions by evaluating them for feasibility (can we build it?), desirability (does the customer want it and will they use it?) and viability (is it sustainable financially?). When asking for feedback on solutions, it is often helpful to build models, or prototypes, for customers and users to visualize and touch. Prototyping accelerates the communication between innovator and customer. Based on the feedback, we revise the solution, develop another prototype and gather more feedback. The process is repeated many times to reach a final solution.

After agreeing on a final solution, we ask for feedback from the implementers, who are the people responsible for bringing the product or concept to the users and supporting it. Their input is critical because even the best concepts or products might not be adopted by customers and users if the concept can not be easily taught or supported.

Biomimicry

The Olympic and Paralympic Museum in Colorado Springs has an area devoted to innovations and developments in materials for competitive athletic gear, based on properties and characteristics seen in nature. Think of sharkskin-inspired swimwear and turtle shell properties that are incorporated into skis. This observation of nature and repurposing characteristics creates innovative solutions, known as biomimicry.

Georges de Mestral's VELCRO® Brand products are examples of biomimicry. His innovation went beyond nature. He used the idea of barbershop clippers to produce a hook shape. The name VELCRO® is a combination of the first three letters of the French words velour (velvet) and crochet (hook).[2]

Conclusion

Some claim that creative people are born with talent, or one must be a daydreamer to be creative. I disagree. Creativity can be learned and reinforced. It takes practice, repetition and sometimes a change in thinking or perspective or being willing to question assumptions. We find and develop new products and services when we want to make improvements.

At times, we let perfection get in the way of innovation. Try aiming for less-than-perfect solutions initially to encourage risk-taking and innovation. If we demand 100% success on every new venture, we will be stuck with the status quo because no one will try anything new with a bar set that high.

I am not suggesting that a 70-80% solution is ready for public release, particularly in health care, or we should be satisfied with that result. It is a starting point, followed by iterative incremental improvements to get to an optimum solution.

Create a safe environment where implementers and co-workers feel secure to offer honest and critical feedback on concepts and early prototypes. Take the time to get customer and market feedback before launching a product or service. Resist the urge to jump to solutions too early.

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2. Unexpected Inspiration. Velcro IP Holdings LLC. Accessed October 3, 2024. https://www.velcro.com/original-thinking/our-story/

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3. Strunk W Jr, White EB. *The Elements of Style*. 4th ed. Longman; 2000.

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4. Mettam GR, Adams LB. How to prepare an electronic version of your article. In: Jones BS, Smith RZ, eds. *Introduction to the Electronic Age*. E-Publishing; 2009:281-304.

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[data set] 5. Oguro, M, Imahiro, S, Saito, S, Nakashizuka, T. Mortality data for Japanese oak wilt disease and surrounding forest compositions, Mendeley Data, v1; 2015. http://dx.doi.org/10.17632/xwj98nb39r.1

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