How to Create and Host an Ultrasound Competition for Students

A Guide to Hosting Your Own Ultrasound Competition

INTRODUCTION

Creating a safe, engaging, and active learning community is the goal of every sonography school. But if you could provide an experience that was all that and fun, would you do it?

Hosting an ultrasound competition is one way to give your students a learning experience that they will remember and refer back to throughout their career as a sonographer. The competition can also motivate them to learn more, and the experience will help them retain what they learn and improve their imaging skills.

Students, however, aren't the only ones who benefit from an ultrasound competition. By hosting, or participating in, an ultrasound competition, you are exposing your students to real-world scenarios, allowing them to interact with mentors, and preparing them for their careers. In other words, ultrasound competitions are a win-win.

By hosting, schools:
1. Create a fun environment to challenge their students
2. Teach via gamification
3. Create a networking opportunity
4. Build a collegial atmosphere
5. Enhance their students' knowledge

By participating, students:
1. Network with fellow sonography students and mentors
2. Learn or reinforce knowledge and skills
3. Build team working skills
4. Practice time management
5. Have FUN!

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CASE STUDY: SONOBOWL

In 2018, the American Institute of Ultrasound in Medicine (AIUM) worked with neighboring sonography schools to develop and present SonoBowl, a sonography school student ultrasound competition that included question-and-answer sessions, live scanning, and case challenges.

For the inaugural competition, Howard Community College (HCC) served as host, and teams from HCC; Montgomery College; Pennsylvania College of Health Sciences; and University of Maryland, Baltimore County participated. Although only 4 students from each team could participate, many more attended to observe and cheer on the competitors.

HCC and the AIUM worked together to create this event by planning the itinerary, developing questions and case challenges, inviting teams, and setting up the event. All of the planning resulted in an ultrasound competition that included 3 rounds: a question-and-answer round, a round for scanning live models, and a round with a case challenge.

Round 1 was a question-and-answer session, in which each team was supplied with a tablet to use for answering multiple-choice questions as quickly as possible, as points were based on speed and accuracy.

Round 2, was a hands-on demonstration of the students' ultrasound imaging skills. The teams were given 15 minutes at each of 5 stations, equipped with a visible timer, an ultrasound machine, and a live model, to complete a task and answer a few questions. A proctor at each station reviewed the ultrasound image obtained for the task and indicated on a scoring sheet whether the correct anatomy was imaged and whether the answers to the questions were correct. After the 15 minutes, the teams rotated stations until all teams had competed at each station.

For those students who attended but were not participating, a scavenger hunt was developed to fill the time. The students were randomly divided into 4 teams, each of which included students from each of the schools to encourage networking. Each team was given a campus map and a list hinting at 15 things to find around the campus. They were tasked with answering questions for some and taking a selfie at each to prove they found them. For example, one such hint was "Orange is definitely your color! Take a selfie with your face in the circle," referring to a sculpture outside one of the buildings. Once Round 2 was complete, a lunch was provided.

Round 3 was a Jeopardy! round. Each team had to wager based on the number of points they had earned in the previous 2 rounds.

The teams were given a brief case history and shown the ultrasound images associated with it. Teams were then given 1 minute to choose one of 4 possible answers. After time was up, each team, starting with the one in last place, revealed their wager and answer. For this inaugural SonoBowl, the winning team was awarded a trophy to hold onto until the next SonoBowl, when it will be back up for grabs.

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HOSTING YOUR OWN ULTRASOUND COMPETITION

If you are reading this, you are probably interested in starting your own competition for sonography students. Excellent! This playbook will walk you through the key aspects of creating an event; the decisions you will need to make; provide an idea of the time frame needed; and provide a checklist of important things to do.

WHO'S THE CHAMPION?

For an event like this to be successful, you need a champion--a person dedicated to ensuring all the tasks get completed and the event happens without a hitch. An effective strategy is to create a planning committee to manage the work and logistics of the competition. A competition like this can be a lot of work so having a dedicated set of individuals who have specific roles will help tremendously. So as you get started, determine your champion!

SELECT A HOST SITE

To have a competition, you need a host site. As you begin to build the elements of the competition itself, you will need to determine what your space needs will be. Some questions to consider:

1. Will you have a scanning round? If so, you need to make sure you have enough space for scanning stations. The ideal location will already have machines so you don't need to transport or arrange for machine delivery.
2. Do you have space for all teams and spectators to gather? If that is needed and desired, make sure you have the room you will need.
3. What are the A/V requirements? If any rounds require projection, where will that occur? Do you have what you need if you decide to record or stream the event?
4. Does the host have the other technological elements you may need? Are you using tablets or computers? Do you need internet access?
5. Will you provide a meal? Depending on the timing of your event you may decide to provide a meal. Does the host site have space to do that? Does the host site offer catering or will you need to handle this?

As you create your event, other questions will arise. Make sure that the host can accommodate those needs.

CHOOSE A DATE

Now that you have a site, you need to select a date. When do you want to hold this competition? Some factors to consider:

1. What is the best time of year?
2. Do you need to coordinate with other schools?
3. Will transportation be a factor depending on when you hold the competition?

Be sure to choose a date far enough in advance so that you have the time you need to plan the event itself. For a first-time event, you should plan at least 3–4 months in advance. In subsequent years you should be able to reduce the timeline.

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STRUCTURE THE COMPETITION

The competition is what the participants are coming for and the area where you will more than likely spend most of your time. Some things to consider:

1. How many teams? This may be dictated by the number of students at your school or the number of schools participating in your competition. It may also be dictated by how much space you have.
2. How many members per team? Factors to consider may include the space you have for each station and the skills needed for each round. In the case study example of SonoBowl, teams were 3 individuals and an alternate.
3. What specialties? The knowledge of the teams may dictate the specialties you cover in your questions. No sense having vascular questions if your students don't study vascular ultrasound--unless you want to challenge them!
4. How do you manage the rounds? In the case study, there were 3 rounds. All teams competed in 2 rounds and the top teams competed in the final. You may want all teams to compete in 3 rounds and the top-scoring team wins. Or you may want to structure a head-to-head tournament where the top 2 teams face off.
5. When and where do you break? To facilitate scoring, and to give the teams a bit of downtime, schedule breaks during the competition. The easiest is to have a break after each round. This will depend on whether or not you are having lunch.

Rounds

As you look to create your competition, consider structuring it in rounds to give participants as much game time as possible. Be creative in how you structure your rounds. Here are some options to consider:

1. **Question-and-answer.** Develop curriculum-based questions for teams to answer. This could be interactive (ie, Kahoot! or Jeopardy!), timed, pen and paper, or any other method that works for you.
2. **Scanning.** Teams have to scan live models or phantoms and have to secure certain images. Be creative—give them a blindfolded scanning challenge.
3. **Case Challenges.** Present cases to each team and they have to determine diagnosis.

There are probably several other models that will work. The key is to give all participating teams as much time to play as possible. If any of your rounds need questions, here are some ways to help secure those:

1. Ask your faculty, or the other participating schools, to submit questions. This could also be a task for a subgroup of your planning committee.
2. Use program study guides as reference material or pull from old testing material.
3. Ask your clinical sites to submit questions.
4. Check out the AIUM's CME tests for sample questions.
5. Partner with another school and have that school write your questions and you write theirs.

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SOLICIT VOLUNTEERS

No matter what your final structure, undoubtedly you will need volunteers. And we are talking over and above those who volunteer on your planning committee. If you are holding an in vivo scanning round, you will need volunteers to serve as the models and others to serve as proctors. Ensure that all volunteers are given clear direction as to their role. You may require that each team provide a model (and then shuffle the models so that teams don't have models from their own school or program).

When looking for models and proctors, don't overlook other students, faculty, and individuals at your clinical sites.

Tip: Creating a spreadsheet to document volunteers, participants, and spectators—including email addresses—may come in handy for post-event follow-up communications.

INVITE PARTICIPANTS

Once you know the where, when, and what, it's time to invite participants. But first, you need to determine how you will select the participants:

1. Will you open registration to all ultrasound students in your school?
2. Will you invite other schools to participate?
3. Will you limit it to only 1st year or 2nd year students?
4. Will you allow mixed-year teams?
5. Will you allow participants who just graduated?
6. If you get more teams than you can accommodate, how will you decide which teams will compete?

Generate an invitation list with the mailing or email addresses of those with whom you wish to invite. Invitations can be printed, emailed, or sent via a third-party web application.

EVENT LOGISTICS

There are a tremendous amount of logistics to consider when planning a student ultrasound competition. In addition to the material that has already been presented, you should consider the following:

Food
You may choose to provide food during the registration hour, during lunch, and/or at any other time during your event. If catering is needed, the orders should be made once a rough headcount is determined.

Badges or Other Identification
To facilitate networking and identification of everyone involved in the event, badges or name tags listing the individual's name and school or affiliation can be helpful. You can choose to create them yourself or order them once all teams, faculty, staff, and volunteers have been identified.

Supplies
When planning the event, listing any supplies you will need will make it easier to ensure that you have everything you need on the day of the event.

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Sample supply checklist:

Item	Quantity	Responsible Party
Tablets		
Ultrasound machines (inc. spare)		
Scanning gel		
Gloves		
Sheets		
Towels		
Food/Drink and related supplies		
Clipboards		
Pens		
Registration forms		
Badge holders		
Model consent forms (Appendix A)		

Signage
Ensure that the competitors will be able to find the event by creating and posting signage. A sign placed outside of the main building's front door, as well as signs directing students to the correct room(s), will help to prevent lost competitors and reinforces who is hosting and who is sponsoring the event, if applicable. Include any signs needed in your game as well, such as station numbers for a scanning round. And don't forget to include signage at the registration desk, so everyone will know where to check in, and signs notifying of the availability of wifi, if applicable.

If the budget prevents the creation of signs, you may need a larger number of volunteers to direct your participants.

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PROMOTE THE EVENT

Social media can be a great tool for promoting and covering your event. Promoting your event on local and/or your school's media, such as in newspapers or on the radio, can also help to draw interest in the ultrasound competition and the school. If your school has a media program, ask them to cover it.

In addition to using images and linking to the event or school website, consider offering live video of the competition itself as a way of promoting your school as well as the event. Avenues such as Facebook Live, Twitter, Instagram, and other social media outlets are easy to use and are far-reaching. After the event, posting about the winners can also garner attention as the winners may want to share it as well.

SPONSORS

Sponsors are a great way to underwrite and support your event, if allowed at your school or program. This is true in terms of finances as well as in-kind. Consider inviting your clinical sites, suppliers, and manufacturers to support your event. Check your supplies list for what you need--and don't forget you will need prizes for the winning schools.

RECOGNIZING THE WINNERS

At the end of your competition, be sure to recognize the winners. Ideas include a prize pack, a trophy, some school-related gift, or other cool ideas. Keep in mind you could always solicit sponsors to provide prizes.

Don't forget to thank and recognize your volunteers--especially your planning committee!

EVENT FOLLOW-UP

The end of the competition isn't the end of your project. If you are considering making this event a yearly competition, start your planning now. Capture video you can use to promote the event next year, survey participants to find out what they liked and what they didn't, and ask volunteers to commit.

Tip: Consider having a debrief call with the planning committee shortly after the event to get feedback and idea on how to improve for next year.

TIMELINE

The following is a sample event timeline that can be altered to fit your event. Keep in mind, 8 weeks is an aggressive timeline—especially if it is your first year.

8 Weeks Out
1. Champion for the event is selected
2. Host school is selected

6 Weeks Out
1. Solicit and secure volunteers and support staff
2. Create an itinerary for the event
3. Invite student teams to register

4 Weeks Out
1. Reserve room logistics (machines, A/V, etc)
2. Gather supplies for on-site stations

2 Weeks Out
1. Create and print on-site signage
2. Print badges or name tags
3. Schedule post-event follow-up activities
4. Prepare bags with education information and giveaways, if applicable
5. Order food, if applicable

Game Day!
1. Arrive early to set up stations and the registration table
2. Enlist help for clean up
3. Have fun!

MORE THINGS TO THINK ABOUT

As with any event, there is a lot to think about in hosting an ultrasound competition. Here are a few other items to consider when making your decisions:

How will you handle spectators? It's always good to have people watch and cheer. However, in a competitive environment, you have to watch for possible cheating. If you are going to have spectators, consider how, when, and where they will have access to the competition area or the teams. You want your event to be as fair and fun as possible.

Team movement and timing. Be very careful of the timing of your rounds and the movement of students. If you are using separate buildings or floors, give teams enough time to travel to their destinations.

Scoring. You spent a lot of time developing questions and rounds, but what about scoring? There are many ways to score the event--pen and paper, Google forms, etc. Make sure you have enough time for

the scoring volunteers to do their job--especially if the scores determine which teams move on to further rounds.

Back up plans. Having contingencies and back up plans are always important. What if volunteers don't show up? What if a machine breaks down? What if the weather is bad? Try to walk through all the possible scenarios you can think of and plan accordingly.

Consider safety. When it comes to using medical ultrasound, safety is of the utmost importance. Consider having a safety briefing prior to the start of the event. You can cover topics such as ALARA, bioeffects, and prudent use. The AIUM has a number of official statements that can be used as reference.

ULTRASOUND COMPETITION EVENT PLANNING CHECKLIST
- ☐ Choose a champion
- ☐ Select a host site
- ☐ Prepare for A/V requirements
- ☐ Choose a date
- ☐ Determine the competition's structure
- ☐ Solicit volunteers and assign staff
- ☐ Invite participants
- ☐ Order food
- ☐ Create badges or name tags
- ☐ Order supplies
- ☐ Create signage
- ☐ Promote the event
- ☐ Set up the event
- ☐ Hold a great ultrasound competition
- ☐ Complete event follow-up

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Appendix A
Sample Model Consent Form

Diagnostic ultrasound has been in use since the late 1950s. There are no confirmed adverse biological effects on patients resulting from this usage. Although no hazard has been identified that would preclude the prudent and conservative use of diagnostic ultrasound in education and research, experience from normal diagnostic practice may or may not be relevant to extended exposure times and altered exposure conditions. It is therefore considered appropriate to make the following recommendation: When examinations are carried out for purposes of training or research, ultrasound exposures should be as low as reasonably achievable (ALARA) within the goals of the study/training. In addition, the subject should be informed of the anticipated exposure conditions and how these compare with normal diagnostic practice. Repetitive and prolonged exposures on a single subject should be justified and consistent with prudent and conservative use.

NOTE: A Live Scanning Consent Form must be completed for each session you have volunteered to model.

This is an agreement between _____ (school name) and the following Live Scanning Subject _____ (type your name) during _____ (name of event):

LIVE SCANNING SUBJECT REQUIREMENTS
- ☐ I understand there will be an educational component to this live scanning activity that will not directly benefit me, but may indirectly benefit future patients.
- ☐ I understand that images obtained during this activity are not intended for medical diagnostic purposes.
- ☐ I understand I will be pre-scanned by a licensed healthcare specialist and any discovered anomalies or pathology will be reported to me with a recommendation that I seek a physician's advice.
- ☐ I have been provided information on the safety and potential biological effects of diagnostic ultrasound and the MI and TI and subsequently grant informed consent to the scanning activity.
- ☐ I understand all equipment will have received FDA clearance and will be used in a manner consistent with its FDA-cleared indications for use. Also, only equipment that has been FDA-cleared for ophthalmic indications will be used to scan the eye during the demonstrations.
- ☐ I understand demonstration scans on live, non-pregnant subjects will be performed in a manner consistent with the ALARA principle for demonstration purposes.
- ☐ If higher exposure conditions are needed for the demonstration, then I understand that I will only be scanned once per day similar to the exposures experienced during clinical practice.
- ☐ I understand that I am to be appropriately clothed for the specific scanning activity.
- ☐ If this is an activity for which no formal Continuing Medical Education (CME) is issued, I attest that I am at least 18 years of age.

ACCEPT REQUIREMENTS

- ☐ I understand and accept the Live Scanning Subject Requirements.
- ☐ I attest to the best of my knowledge that I am not pregnant and that I may be participating in upper abdominal scanning activities.
- ☐ I understand and accept this Live Scanning Subject Requirement. I am physiologically male.
- ☐ FEMALES: I attest to the best of my knowledge that I am not pregnant and that I will be participating in abdominal/pelvic scanning activities. *
- ☐ I understand and accept this Live Scanning Subject Requirement.

Scanning of pregnant subjects is only permissible in instances where formal CME credit is issued and must also follow the AIUM Statement: Guidelines for Hands-on Scanning in Pregnant Subjects During AIUM-Sponsored Educational Activities.

☐ I am pregnant and understand that if the purpose of the activity (which includes abdominal/pelvic scans) is fetal scanning, scanning of a known pathology, or scanning of a known medical condition, I represent that I have had the opportunity if I so wish to discuss this activity and the possible risks associated with the activity with my physician. By signing below, I represent that I have had the opportunity to ask all my questions regarding the activity and that my questions have been answered to my satisfaction. _____ will rely on this and other representations made by me in _____ decision to use me for this activity.

Confirmation for Pregnant Subjects

- ☐ I understand and agree with the above statement.

Live Scanning Subject Consent

The Live Scanning Subject releases _____ from any and all liability arising out of this activity except for any direct and actual damages arising from willful misconduct of _____.

Activity records that identify the Live Scanning Subject are kept confidential as required by law. Federal Privacy Regulations provide safeguards for privacy, security, and authorized access. Except when required by law, Live Scanning Subject will not be identified by name, social security number, address, telephone number, or any other direct personal identifier in study records disclosed outside of _____.

The Live Scanning Subject hereby authorizes _____ to use the information obtained in this activity for any commercial business purpose (such as advertising, product literature, etc) on the condition that the Live Scanning Subject's name is not disclosed.

By signing below, the Live Scanning Subject represents that he/she has read and carefully considered the contents of this agreement, that the Live Scanning Subject is in agreement with all the terms herein, that the information provided above is true and accurate to the best of the Live Scanning Subject's knowledge and that the Live Scanning Subject consents to the ultrasound scanning activity under the terms of this agreement.

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Signature

☐   By checking this box, I comply with the terms of this agreement as if I physically signed and forwarded a paper consent form.

Name:

Date:

Email:

Phone Number:

Address:

NOTE: This is only a sample and proper legal counsel should be consulted.

Appendix B

As Low As Reasonably Achievable (ALARA) Principle

The potential benefits and risks of each examination should be considered. The ALARA (As Low As Reasonably Achievable) Principle should be observed when adjusting controls that affect the acoustical output and by considering transducer dwell times. Further details on ALARA may be found in the AIUM publication *Medical Ultrasound Safety*.

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https://www.aium.org/officialStatements/39

Appendix C

Guidelines for Hands-on Scanning in Pregnant Subjects During AIUM-Sponsored Educational Activities

1. Subject participation should require appropriate informed consent. The primary obstetrician providing prenatal care should be informed of his/her patient's participation.
2. The subjects should be afebrile and prescreened to attempt to avoid unexpected findings.
3. There should be a plan to address unexpected findings should they be observed during the educational course.
4. There should be no first trimester examinations.
5. Exposure time, ie duration of "hands-on" teaching session, should not exceed 1 hour per pregnancy.
6. Exposure to pulsed Doppler should be restricted to instructor scanning for short durations only.
7. Examinations should be performed in a manner consistent with the As Low As Reasonably Achievable (ALARA) principle, including limiting the TI (≤0.7) and MI (<1.9) as necessary for educational purposes.
8. Only courses approved for Continuing Medical Education (CME) credit are acceptable.

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