

THEATRE DESIGN & TECHNOLOGY

WINTER 2022



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Welcome to the Winter 2022 issue of *Theatre Design & Technology*. In this issue, our authors continue to discuss the pandemic's impact on theatre, but they do so alongside hopeful plans for the future and explorations of how newer technologies can reimagine traditional workflows.

Athene Wright and Rachel E. Pollock start off the issue with a case study of how 3D printing can update hat blocking processes. As they explain, traditional wooden hat blocks deteriorate over time, making replication difficult, but new technologies allow for 3D scanning of existing hats and the creation

of durable 3D printed hatblocks that can be replicated or reprinted as needed.

Matt Reynolds, inspired by pandemic pivoting and student needs, explores the role of universal design and other accessibility aids in education. A lighting designer, Reynolds primarily focuses on challenges in classrooms and in lighting and stage situations, though much of the advice is transferrable to other disciplines and also to workplaces facing a similar need to create accessible spaces and experiences.

Naoko Skala examines the pedagogical uses of 3D virtual modeling to teach students about Japanese traditional staging and architecture. Working from ground plans of Noh stages, Skala offers instructions and an assessment of using software to create a more immersive learning experience. Skala's article also includes links to the files and a brief history of traditional architectural developments in Nohgaku theatre, enabling readers to share these lessons with their students.

Finally, in the spirit of so many of the groups who have been advocating for changes to our theatrical habits, we invite readers to expand that assessment to undergraduate theatre labor on academic productions. As a jumping off point for this discussion, we offer a reprint of the Coda of Christin Essin's new book, *Working Backstage: A Cultural History and Ethnography of Technical Theatre Labor*. Essin raises many questions in the Coda as she applies lessons learned from interviewing Broadway laborers to her own academic department. In doing so, she asks us to consider the role of undergraduate labor in university and college productions (and by extension in high school shows). We will hold space in an upcoming issue for responses from readers, and we invite anyone who is interested in weighing in on the complexities of this issue to please send your submission by March 15 to tdteditor@usitt.org.

—Eileen Curley, Editor

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Accessibility in Technical Theatre

How can we make technical theatre more accessible for people of all abilities?

BY MATT REYNOLDS

As we navigate new theatre and education protocols imposed by the pandemic, incorporating accessibility has never been more opportune. While the term “accessibility” largely may have been associated with wheelchair access in the past, people are quickly realizing that accessibility goes far beyond ramps and elevators and includes accommodating non-visible disabilities, both physical and mental, for the 26 percent of adult Americans who have a disability (Centers for Disease Control and Prevention). These necessary accommodations also include access to technology, all of which can be further compounded by the intersections of economic and social disadvantage.

Transitioning from hands-on learning to remote learning has revealed a cavalcade of barriers for teaching the art of live theatre. How does one build a flat if they cannot access a saw? How does one fit a costume from 6 feet away? How does one focus a lighting instrument if they cannot be on campus? Sure, some of us have the privilege to bide our time until this upheaval passes, but what about those for whom these challenges are not tied to the pandemic, but rather are a long-term, daily trial? In the demanding world of technical theatre, long hours, heavy lifting, and precarious heights are expected daily requirements to do the job. What can we do to make the execution of these tasks more safely accessible for people of all abilities? By collaborating with people with disabilities to find solutions, offering reasonable accommodations, and

Author's note: This article utilizes primarily person-first language (person with disabilities) rather than identity-first language (disabled person) for consistency. My research has encountered preferences for each but more preferences for person-first language.



zlikovec/Stock Photo



humoniz/Stock Photo

utilizing principles of universal design moving forward, we can create a safer, more inclusive workplace for all theatre technicians.

Consider the following recommendations:

1. Embrace the challenges offered by each student's abilities. Some years ago, I received a notification from my university's Office of Disability Services (ODS) that a student in my stage lighting course would require "reasonable accommodations." No problem, I thought, they probably just need time-and-a-half on their timed assignments, since that's the most common request I receive. However, I found

that the student in question lived with significant visual impairment, requiring a folding cane, an e-reader, and at least a 24-point font on all paper assignments in addition to a doubled time allowance.

I was not prepared for the impact this student's accommodations would have on the course. How would they focus a lighting instrument, or safely use a personnel lift, or interpret a 1/4" scale printed plot, or analyze the fine details of lighting effects on costumes and scenery? I was surprised by just how woefully inaccessibly I had designed the course, having not considered the possibility of a visually impaired student. I immediately set to work adapting the course to the student's needs, creating

large-print versions of all handouts and assignments, adding descriptive text to my PowerPoint images, and finding safe training opportunities for them at deck-level. In the end, the student told me they had learned a lot, had a blast, and did not feel isolated from learning opportunities.

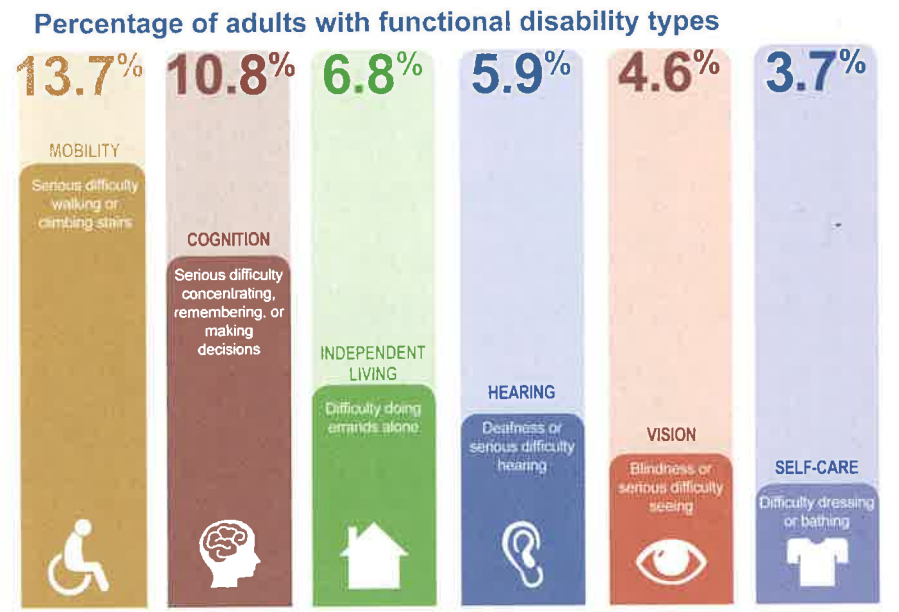
The first lesson I took away from this experience was to embrace the challenges offered by each student's abilities. It is a guiding principle as an educator to meet each student where they are and help them in the way that is best for them. Sometimes this means providing a framework on each topic wherein each step aids different learners, such as explaining a concept several ways for auditory, visual, and kinesthetic learners. This time, it meant supplementing or improving the predominantly visual aspects of the course.

2. Utilize a practice of universal design for every facility, every set, every work call, every syllabus moving forward. Passive exclusion is endemic not only in our industry but in our society at large and could be attributed to the traditional "impairment" perspective of disability. The impairment perspective, or medical model, of disability views the challenge of accessibility from the perspective of adapting the person to the environment (prosthetics, wheelchairs, hearing aids, etc.). Today there is a significant push toward the civil rights perspective, or social model, which approaches the same challenge from the perspective of adapting the environment to suit all persons (ramps, beeping/flashing crosswalk signs, handrails, etc.). Universal design is an approach used across many industries to facilitate the shift to the social model. Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without adaptation or specialized design (Center for Universal Design), which is based on seven principles:

1. Equitable use: Useful to people with diverse abilities, not just the majority.
2. Flexible use: Allows for individual preferences and abilities.
3. Simple and intuitive: Easy to understand, regardless of individual knowledge and skills.
4. Perceptible information:

- Communicates effectively, regardless of environmental conditions or abilities.
5. Tolerance for error: Minimizes adverse consequences to accidental actions.
6. Low physical effort: Requires little effort to use effectively and comfortably.
7. Appropriate size and space: Can be used regardless of user's physical ability.

These are excellent guidelines for renovations and new construction in particular. Much of universal design comes down to fine detail work, but must be considered systemically throughout the process. In architecture, this includes elevator-accessible catwalks, 5-foot wheelchair turning radii, simple signage, loud horns and bright strobe lights for pit lifts, stage edge transitions to feel and see when you're approaching the edge, high-contrast painted undergrids to optimize visibility, and much more, according to Aaron Wong, an associate with Theatre Projects (a theatre design firm). "Universal design is evolving. It's been around for a while, but in regard to architecture...it's becoming more and more at the forefront of design work," he continues. "Universal design is a great next step, but it's not the last step. I'm always looking for answers and feedback. I ask technicians for specifics on accommodations: How



Source: CDC. Use of this material does not represent a government endorsement of this content. This and additional material can be found, free of charge, on the CDC website and at https://www.cdc.gov/ncbddd/disabilityandhealth/documents/disabilities_impacts_all_of_us.pdf

can your experience better the next person coming in? So, we are constantly evolving theatre to be more inclusive not only onstage, but backstage as well."

Universal design aims to make every task reasonably accessible to as many different people as possible. This concept translates directly to education. The University of Washington's DO-IT organization (Disabilities, Opportunities, Internetworking, and Technology) provides myriad resources to advance "the success of people with disabilities in careers, research, and education," including the university's Center for Universal Design in Education (CUDE). These resources include quick-and-easy checklists, tutorials, articles, books, news, and more,

"Anyone can become part of the disabled minority at any point in their life."

—Aaron Wong, associate with Theatre Projects

with categories for instruction, distance learning, physical spaces, student services, projects and exhibits, and technological environments. Dr. Sheryl Burgstahler, director of DO-IT, has compiled much of this research in *Creating Inclusive Learning Opportunities in Higher Education: A Universal Design Toolkit*, but here are several of her tips for accessible digital materials such as presentations, paperwork and videos. (Source: <https://www.washington.edu/doit/20-tips-teaching-accessible-online-course>)

- Use clear, consistent layouts and organization schemes to present content.
- Use a text-based format and structure headings, lists, and tables using style and formatting features within your Learning Management System (LMS) and content creation software, such as Microsoft Word, and PowerPoint and Adobe InDesign and Acrobat; use built-in page layouts where applicable. (Microsoft Office and Adobe products offer built-in accessibility checkers.)
- Use descriptive wording for hyperlink text (e.g., "DO-IT website" rather than "click here").
- Avoid creating PDF documents. Post most instructor-created content within LMS content pages (i.e., in HTML) and, if a PDF is desired, link to it only as a secondary source of the information.
- Provide concise text descriptions of

content presented within images (text descriptions web resource).

- Use large, bold, sans serif fonts on uncluttered pages with plain backgrounds.
- Use color combinations that are high contrast and can be distinguished by those who are colorblind (color contrast web resource).
- Caption videos and transcribe audio content.
- Don't overburden students with learning to operate a large number of technology products unless they are related to the topic of the course. Use asynchronous tools and make sure IT used requires the use of the keyboard alone and otherwise employs accessible design practices."

When asked about the relationship between universal design and the Americans with Disabilities Act (ADA) compliance, Wong clarifies that ADA is civil rights legislation, not building code, but it does affect building codes. For example, it is a common myth that buildings built before the 1990 iteration of that law are exempt from ADA compliance. According to ADA.gov,

"Don't be afraid to ask if you messed up or ask if something should be different. In the same sense that a lot of you haven't thought about these questions, I haven't been asked these questions."

—Andrew Brown, actor

"there is no 'grandfather clause' [sic] in the ADA that exempts older facilities," though the very detailed standards and regulations do contain exceptions such as "undue financial and administrative burdens." This is where we commonly run into the ADA legal terms.

Here's what ADA says:

- **Section 504:** Disability legislation started as Section 504 of the Rehabilitation Act of 1973, but only applied to higher education, and was enforced by the Department of Education's Office for Civil Rights.
- **Americans with Disabilities Act (ADA):** This 1990 law built upon the 1973 law to include individuals with disabilities as a protected class (along with race, color, sex, national origin, age, and religion) in all areas of public life, and is enforced by the Department of Justice.
- **Individuals with Disabilities Education Act (IDEA):** This 2004 law expanded the definition of "disability" in education to include mental disabilities, like learning disorders, in order to provide reasonable accommodations for education services.

- **Americans with Disabilities Act Amendments Act (ADAAA):** This 2008 law took the expanded definition of "disability" from IDEA and applied it to all areas of public life, essentially providing for equal opportunities and reasonable accommodations to persons with disabilities in employment, education, and public access.
- **Disability:** The current legal definition of this term qualifies disability as a physical or mental impairment (bodily, cognitive, or emotional) that substantially limits one or more major life activities, as well as a record of such impairment or being regarded as having such an impairment.
- **Accessibility:** This broad term includes not only physical access such as wheelchair ramps, but the design of products and environments for all manner of disabilities.
- **Reasonable accommodation:** This purposefully nonspecific term is a legally binding modification to products, environments, policies, and procedures to provide equal access to persons with disabilities.

In all instances of public interaction, we are required to make reasonable accommodations for persons with disabilities. As one can imagine, "reasonable accommodation" is deliberately vague to provide for flexibility in interpretation under the law but is the key concept in both implementation and adjudication. For instance, while it would be ideal for everyone to install elevators to every hang position, it would be extremely expensive and, in some facilities, would depend on extensive renovations, an undue financial burden. A reasonable accommodation could be to install a suspended focus chair on a hanging track, or build ramps to positions that can use it, or utilize a person with mobility challenges on deck or at the board. It would not be reasonable to discriminate in the hiring, firing, or compensation of an otherwise qualified individual because of their disability; that's illegal. An organization does not have to have such accommodations in place before hiring a person with disabilities, but it always helps to have the infrastructure in place. This goes back to having a simple conversation to ask how one could accomplish a specific task and problem-solving together.



"Disability is very individual. What works for one person doesn't necessarily work for another."

—Betty Siegel, director of VSA and accessibility at the Kennedy Center

Who are we?

Find out by browsing the easy-to-digest sections of the **USITT Workforce Demographics Study**, the first of its kind look at the performing arts design and technology communities.

Learn more at www.usitt.org/wds

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The 2021 Entertainment Design & Technology Workforce Demographics Study was conducted April 1 - June 5, 2021 by SMUDataArts.

3. Have a private, informal conversation between the person with disabilities and the supervisor/instructor. "Show that you understand and try to make [the conversation] as seamless as possible," suggests Professor Terena Wilkens, lights and sound designer in theatre and dance at Gustavus Adolphus College. "You don't want to have this conversation on the first day of class in front of everyone." Wilkens points to an example of student with a birth defect of a shortened arm assigned to the scene shop. "I explained what was going to happen and she asked, 'Can I not go first? Can I do this? Can I do that?' For the panel saw, we needed more time to prepare for that one. 'Am I allowed to step on a box, because I can't reach the panel saw at the top?' She found her answers. Nobody else even seemed to notice; it flowed seamlessly. She's fearless."

The "everyday march of technology" is aiding in the improvement of accessibility in technical theatre, points out Betty Siegel, director of VSA and accessibility at the Kennedy Center.

"Technology is getting smaller, more compact, more portable. The sound board is coming out into the house, so you don't have to climb a ladder to get there anymore. I see lighting personnel running the lights from an iPad. The technology will be adapted to serve their needs more, but a change of attitude is necessary."

She underlines the importance of seeing more people with disabilities in media, such as 2019 Tony-winner Ali Stroker. "I just want people not to default to a snap judgment. A lot of times we still live with stereotypes of what we think a person with disabilities can and can't do." Siegel stresses the need to shift from the medical impairment model of thought to the social/civil rights model. "If people could make that one shift, then I think overall our field would be healthier. Students with disabilities have a right to be there and you have an obligation to teach. The truth of the matter is you can be an LD and not have to do that [physical] stuff. You can be a TD and not have to hang a light, but you need to know how. I see some of the

basic practices changing. More people with disabilities are considering technical theatre careers as more become available to them.”

“As a person with a disability, I know what I can and can’t do,” adds Brian Sechrist, a Sacramento-based freelance lighting and sound designer. “I have a degenerative disc disease in my back, asthma, and arthritis. It’s a constant pain I go through every day. I don’t want to be sitting on the sidelines; I want to be helpful. My hands have gotten weaker from arthritis, so I can’t trust myself holding counterweights for long periods of time. Being a designer, I don’t have to do as much climbing, but I’d love to. I’m usually lucky enough to send someone else up there [to lighting positions]. I don’t think I’ve ever had a time when I walked in and thought, ‘I can’t do this.’ Generally, there’s not an accessibility issue other than climbing ladders.” When asked what accommodations he does appreciate, he notes only the need to sometimes take a seat and take a breath.

“When I got out of the military they said, ‘you’re disabled.’ No, I’m not. I don’t like labeling myself. If you say I’m a disabled person, you’re going to think I can’t do anything. I want to go into a space and say what I can and can’t do. For a person who is disabled, going to



“Ask the student, ‘what do you think we need to do?’”

—Vanessa Goepel, director of the Office of Disability Services at The University of Alabama

the [supervisor] and saying what you can do and can’t do is huge,” Sechrist says. Particularly tricky for Sechrist is the fact that his disability is not visibly apparent. “Disability is not a subject that is broached by a lot of people. It’s a double-edged sword: You want to explain yourself but don’t want to compromise [your colleagues’] ability to trust you.”

As Sechrist demonstrates, all disabilities are not as visible as a folding cane or wheelchair. “Most people think of the mobility-impaired, vision-impaired, or hearing-impaired, but the big four disabilities we see the most are ADHD, learning disorders, behavioral disorders, and, to a lesser extent, medical disabilities,” says Vanessa Goepel, director of the Office of Disability Services at The University of Alabama. Most behavioral disorders manifest between 16 and 25, so students with anxiety, depression, and occasionally narcolepsy or Tourette’s come to ODS for assistance. While there are users of wheelchairs and permanent crutches (such as for cerebral palsy) or those with fluctuating mobility (multiple sclerosis, Parkinson’s disease), most medical disability requests are connected to low fatigue threshold, bad back, bad knees, bad feet, bad surgeries, degenerative bones, or rheumatoid arthritis.

Seeking ODS support is voluntary, so there are issues of self-identification. “There are individuals who don’t want to ask for help, or it just doesn’t occur to them that there’s something that can be done,” says Sechrist. Amputees, veterans, and athletes with disabilities don’t often go to ODS because they have other support services in place, like Veterans Affairs or Adapted Athletics. Goepel stresses the importance of listing expected physical requirements in the syllabus, such as lifting 50 pounds, working at heights, climbing ladders, and so on. This does not mean students unable to perform such physical tasks cannot take the class, just that the expectations are outlined from the beginning so a conversation can happen ahead of time.

All of these tools, from universal design to ADA compliance, digital content to online resources, do not create instant equity for people with disabilities, especially where disabilities intersect with other marginalized demographics. Remember that accessibility is a prerequisite to equity, and it is not limited



Matt Reynolds serves as assistant professor of lighting, sound, and digital design at the University of Alabama.

In addition to UA, New Mexico State University, Michigan State University (MFA), and Indiana University (BA), his work has been enjoyed internationally at Edinburgh Fringe Festival, Off-Broadway at 59E59 Theatre and Anita’s Way, and regionally at Red Mountain Theatre Company, Horizon Theatre, American Southwest Theatre Company, Phoenix Theatre, Steel Magic Theatre, Cardinal Stage, and Brown County Playhouse, among others. Some of his favorite designs include Aunt Raini (directed by

to ramps and braille signs for patrons. Accessible online content means nothing to a designer who can’t afford a computer. Ramps and elevators in audience spaces are equally necessary backstage to reach catwalks and loading docks. However, these guidelines and regulations are a vital step in the path toward equity. All we need to do is have a conversation and creatively solve problems.

Mark Medoff), Far from Finished (starring Jeffrey Tambor and Neil Patrick Harris), and Rent (directed by Scott Burkell). Reynolds has also designed for fantastic choreographers such as George Pinney, Jin Wen Yu, Shoko Tamai, Bella Lewitzky, Debra Knapp, Sherrie Barr, and Iris Rosa. Accolades include the Gretel Geist Design Award, multiple publications by USITT and Southern Theatre Magazine, and multiple KCACTF Regional Selections for sound and lighting design. Reynolds strives, through theatrical design, to amplify marginalized voices and tell compelling stories. As an instructor, he encourages experimentation, self-reflection, and most importantly, play. www.MattReynoldsDesigns.com

Author’s note: Thank you for your willingness to have a conversation, Andrew Brown, Vanessa Goepel, Laurie Rubenstein, Brian Sechrist, Betty Siegel, Terena Wilkens, and Aaron Wong.

Land acknowledgement: This article was written in Tuscaloosa, Alabama, on the ancestral land of the Creek and Choctaw peoples and the Mississippian mound-builders before them.

For More Information

ADA Regulations

<https://www.ada.gov/>

Job Accommodation Network

<https://askjan.org/>

ADA National Network

<https://adata.org/>

CDC Disability and Health resources

<https://www.cdc.gov/ncbddd/disabilityandhealth/>

Kennedy Center’s Leadership Exchange in Arts and Disability network

<https://www.kennedy-center.org/education/networks-conferences-and-research/conferences-and-events/lead-conference>

University of Washington’s Disabilities, Opportunities, Internetworking, and Technology organization (DO-IT) guidance on Universal Design

<https://www.washington.edu/doi/>

North Carolina State University’s Center for Universal Design

<https://projects.ncsu.edu/ncsu/design/cud/>

Disability Arts Online

<https://disabilityarts.online/>

National Endowment for the Arts accessibility resources

<https://www.arts.gov/impact/accessibility/publications-checklists-and-resources>

TheatreCrafts.com accessibility resources

<https://www.theatrecrafts.com/pages/home/topics/accessible-theatre/>

HowlRound article The Importance of Including Disabled Designers

<https://howlround.com/importance-including-disabled-designers>

American Theatre article Act on Accessibility

<https://www.americantheatre.org/2018/10/23/act-on-accessibility/>



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