TechSAge Tool: Guidelines for delivering telewellness programs to older adults with disabilities (V1)

Rehabilitation Engineering Research Center on Technologies to Support Aging-in-Place for People with Long-Term Disabilities (RERC TechSAge)

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TechSAge Tools Overview

TechSAge has designed this tool series to provide instructional guides on how to conduct various aspects of human factors research. The tools focus on including the target population of older adults with disabilities. TechSAge Tools are designed to:

1) Introduce a variety of research methods, procedures, and protocols
2) Provide guides and "how-tos" about implementation
3) Discuss considerations specific to working with adults aging with disabilities
4) If applicable, recommend appropriate wording to describe the method section in publications
5) Point to reliable resources for more in-depth information about the method, procedure, or protocol presented in the tool

TechSAge Tool: Guidelines for delivering telewellness programs to older adults with disabilities

This TechSAge tool provides guidelines for designing wellness classes delivered via video conferencing, or "telewellness" classes, for older adults with disabilities. The tool includes key considerations in the design and execution of telewellness programs, (e.g., software selection, safety, class organization and logistics, social time structure, and technical support), which are informed by our experience developing and conducting a Tele Tai Chi program as part of a clinical trial.

References Related to the Project

Mitzner, T. L., & Remillard, E. T. (2019). How one telewellness project focused on helping older adults with mobility disabilities age in place. *The Journal on Active Aging, 18*(4),72-77.

Mois, G., Mackin, T., Datta, A., Koon, L., Rogers, W. A., Mitzner, T. L., & Beer, J. M. (2019). Perceptions from People Aging with a Mobility Impairment towards using Tele-Technology for Exercise. *Proceedings of the Human Factors and Ergonomics Society 63rd Annual Meeting*. Santa Monica, CA: Human Factors and Ergonomics Society.

Mitzner, T. L., Stuck R., Hartley, J. Q., Beer, J. M., & Rogers, W. A. (2017). Acceptance of televideo technology by adults aging with a mobility impairment for health and wellness interventions. *Journal of Rehabilitation and Assistive Technologies Engineering, 4*, 1-12. doi:10.1177/2055668317692755. PMCID: PMC6453068

Wu, X., Thomas, R. C., Drobina, E. C., Mitzner, T. L., & Beer, J. M. (2017). Telepresence Heuristic Evaluation for Adults Aging with Mobility Impairment. *Proceedings of the Human Factors and Ergonomics Society 61st Annual Meeting* (pp. 16-20). Santa Monica, CA: Human Factors and Ergonomics Society.

Stuck, R. E., Hartley, J. Q., Mitzner, T. L., Beer, J. M., & Rogers, W. A. (2017). Understanding attitudes of adults aging with mobility impairments toward telepresence robots. *Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction (HRI '17)*. ACM, New York, NY, USA, 293-294. DOI: https://doi.org/10.1145/3029798.3038351

Wu, X., Stuck, R. E., Mitzner, T. L., Rogers, W. A., & Beer, J. M. (2016). Televideo for older adults with mobility impairment: A needs assessment. *Proceedings of the Rehabilitation Engineering and Assistive Technology Society of North America (RESNA)*.

Beer, J. M., Mitzner, T. L., Stuck, R. E., & Rogers, W. A. (2015). Design considerations for technology interventions to support social and physical wellness for older adults with disability. *International Journal of Automation and Smart Technology (AUSMT), 5*(4), 249-264. doi: 10.5875/ausmt.v5i4.959

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What Is Telewellness?

Telewellness classes use technology (e.g., video conferencing software) to deliver wellness programs (e.g., exercise, nutrition) remotely. There are many benefits to this approach, including:

- <u>Accessibility</u> – classes can be accessed from anywhere and do not require transportation
- <u>Safety/COVID relevance</u> – individuals can engage in a socially distanced activity
- <u>Expanded reach</u> -– participants in <u>underserved rural populations</u> who may not have as many resources directly available in their area can participate
- <u>Specialized instruction</u> –instructors who have specialized expertise, such as experience working with certain populations, can reach more individuals, as classes are not confined to one location

Different Models of Telewellness Classes

There are two models of telewellness class instruction: live instruction and pre-recorded instruction, each with different options for delivery:

Live instruction

- Both the instructor and one or more participants access the class remotely.
- Alternatively, the instructor could be remote while the participants are co-located (e.g., a remote instructor teaching an in-person senior center class).

Pre-recorded instruction

- Pre-recorded video can be broadcast to a live class in which the participants are co-located.
- Pre-recorded video can be broadcast to a live class in which the participants are not co-located.
- Pre-recorded classes can be watched on demand by an individual.
  *Note: This option is widely available, but lacks group dynamics and the opportunity for participants to interact and socialize.

Overview of Tool

The goal of this tool is to provide guidelines and considerations for delivering remote telewellness classes to older adults with disabilities, from the initial planning stage to class execution. These guidelines are informed by our experience developing and conducting a Tele Tai Chi intervention as a part of a clinical trial.

Tele Tai Chi case study

In the 'Tele Tai Chi' intervention we used Zoom video conferencing to translate an in-person, evidence-based tai chi class (Tai Chi for Arthritis developed by Dr. Paul Lam and offered as a part of the [Tai Chi for Health Institute](#)) to an online, social experience. Participants took part in an 8-week program that included small-group, online classes that convened twice weekly on Zoom. Classes included pre-recorded lessons that were broadcasted directly from the Tai Chi for Health Institute online portal. During the lesson, participants exercised along with the video instruction and their classmates on Zoom in real time (See **Figure 1**). The Tele Tai Chi clinical trial explored whether the Tele Tai Chi program could increase social interaction and positive health behaviors (i.e., physical exercise frequency) among older adults with long-term mobility disabilities.

Figure 1. Screenshot of the Tele Tai Chi lesson on Zoom.

Aims

In this tool, we will present case study examples of protocols and procedures from the Tele Tai Chi study, and provide supplemental material in the appendices. Throughout the tool, specific emphasis will be placed on promoting safety and socialization, and providing technical support. The tool includes special considerations for developing telewellness programs for older adults with disabilities, but the guidelines are relevant for any target population.

PLANNING

Identifying a Software

The first important step in planning a telewellness class, is identification of the video conferencing software that meets the specific needs and objectives for your class. Important aspects to consider during the selection process will vary for each user, but will likely include cost and the ability to include synchronous and asynchronous programming (e.g., broadcasting pre-recorded instruction.) Every software product is different. For example, some were designed for certain populations and some are best for video broadcasting. Table 1 presents four commercially available software products with brief descriptions of the features that are important to consider when using for telewellness classes. We recommend consideration of these factors when determining if a specific software is the best fit for your needs.

Table 1. Video conferencing software examples and features.

Software	Hosting Capacity	Cost	Download /Browser	Scheduling Meetings	Screen sharing/ Recording	HIPAA* Compliance	Other
Zoom	Basic: 1-XX Pro: 1-100	Basic: Free Pro: $149.90 /year/license	Basic: Download: Yes Browser: Yes Pro: Download: Yes Browser: Yes	Basic: Immediate: Yes Advance: Yes Pro: Immediate: Yes Advance: Yes Recurring: Yes	Basic: Audio sharing: Yes Video sharing: Yes Recording: Yes Pro: Audio sharing: Yes Video sharing: Yes Recording: Yes	Basic: No Pro: No Tele-Health: Yes	Basic has a 40-minute limit on group meetings
BlueJeans	Standard (STD): 1-50 Pro: 1-100	STD: $9.99 host/month Pro: $13.99 host/month	STD: Download: Yes Browser: Yes Pro: Download: Yes Browser: Yes	STD: Immediate: Yes Advance: Yes Pro: Immediate: Yes Advance: Yes Recurring: Yes	STD Audio sharing: Yes Video sharing: Yes Recording: Yes Pro: Audio sharing: Yes Video sharing: Yes Recording: Yes	STD: Yes Pro: Yes	Option to directly stream downloaded video from within app
OneClick	Basic: 1-50 Intermediate: 1-120 Custom: Unlimited	Basic: $100/month Intermediate: $200/month Custom: Contact contact@oneclick.chat	All Plans: Download: No Browser: Yes	All Plans: Immediate: Yes Advance: Yes Recurring: Yes	All Plans: Audio sharing: Yes Video sharing: Yes Recording: No	All: Yes	Designed for older adults and tested to be usable for people with mild cognitive impairment
Facetime	1-32	Free on Apple devices	Download: Yes Browser: No	Immediate scheduling only	No screen-sharing feature Recording: Only still photo, no video	No	Only available for download on Apple devices

*HIPAA (Health Insurance Portability and Accountability Act) compliance means the software meets security standards for dealing with protected health information. Unless participants are discussing personal medical or health information, it may not be necessary to use a HIPAA compliant software for your telewellness class.

Safety Considerations

In contrast to in-person wellness classes, participants in telewellness classes do not have an instructor who is physically there with them to provide any necessary adjustments, feedback, and support. As such, it is important to choose a wellness program that is safe and effective for the participant population, allows for modifications for a range of participant abilities, and is appropriate for remote delivery. Below are a few considerations that can help you select the best program and plan ahead to maximize participant safety.

Evidence-based programs

Evidence-Based Programs (EBPs) refer to a wide variety of research-supported, packaged programs to promote health and wellness. EBPs are required to meet a number of standards, including published research studies that demonstrate benefits and safety, and the successful translation of the program in community organizations (National Council on Aging, n.d.; Administration on Community Living, 2019).

Tele Tai Chi Case Study Example

The Tele Tai Chi study is utilizing Seated Tai Chi for Arthritis (Tai Chi for Health Institute) a seated version of an EBP designed to accommodate older adults with a range of disabilities and health conditions (Callahan et al., 2016; Fransen et al., 2007; Voukelatos et al., 2007). We chose this program for a variety of reasons, including: 1) the movements are done seated, which is appropriate given that we are working with older adults who have mobility disabilities, and 2) the classes can be streamed online, which can allow for scaling-up in the future. The evidence-based benefits of Tai Chi for Arthritis include:

- Improved balance

- Increased strength

- Increased flexibility

- Improved psychological health (decreased stress, increased well-being)

- Decreased pain in joints

- Fall prevention

Seated vs standing classes

There is great heterogeneity among older adults pertaining to physical and mobility capabilities. For some, standing for an extended period of time can be difficult or even impossible. Therefore, for older adults, and especially those with disabilities, seated exercise classes can provide a safer alternative to standing classes, as falls and fall-related injuries among older adults are more likely to occur with standing (vs. seated) exercises. Seated exercise classes can be a great way for individuals with upper and/or lower body mobility disabilities to engage in exercise. Older adults who participate in seated exercise classes can still receive benefits, including upper body strength training and lower extremity function (Klempel et al., 2021). Additionally, there is evidence to suggest that even visualizing physical activity in the absence of movement has some benefits (Marusic et al., 2018) because the imagery of actions cause neural activations in similar areas of the brain as those used for executing action (Guillot et al., 2009). Seated classes are also ideal for delivery via video conferencing, as participants will be joining from their computer, tablet, or smart phone.

Standing exercise classes can be delivered via video conferencing, but there are important considerations to ensure the safety of participants. For standing classes, it is important to be able to view your participants' full body to make sure they are moving safely. It may be difficult for participants to set up their device camera in such a way where they can be fully visible to the instructor. For example, it might be difficult for participants to identify and set the best camera angle for a yoga flow class that alternates from laying on a mat to standing upright. To achieve an appropriate setup, we recommend that instructors have a one-on-one meeting with participants via video conferencing before conducting the first class. Adjustable device stands that tilt may also be helpful. Lastly, to accommodate individuals with limited mobility, we recommend offering seated modifications of the standing exercise program to the extent possible.

Home environment

Instructors should ensure participants have a space in their homes in which to safely participate in the class. The table below provides recommendations that participants can use to set up their home environment prior to engaging in telewellness exercise classes.

Recommended environmental setup for seated telewellness exercise classes
1. Prepare your area well in advance of your first class
2. Place your device with webcam on a flat surface, such as a desk or table, so you are able to move your hands freely
3. Sit in a sturdy chair (or wheelchair). Ideally, this is a chair without wheels or a wheelchair that is locked. It is ok if the chair has arms if you prefer to have them or need them to get in and out of the chair
4. Sit in front of your device so that have enough space between yourself and the camera to move your arms at full length without hitting anything
5. Examine and re-arrange your area if needed to have sufficient lighting and floor space
6. Remove any clutter directly next to you; make sure all cords are pushed up against the walls
7. In case of emergency, have a phone or alert device within reach

Note: with this setup, you will be unable to see participant's lower body

These recommendations can be shared with participants before the class. In some cases, such as working with a more vulnerable population, instructors may want to consider conducting an environmental screening to assess where participants plan to participate in the class.

Requirements for physical activity readiness and/or healthcare provider approval

There is risk of injury with any type of physical activity. In conducting telewellness classes with older adults with disabilities, it is especially important to know if participants have health conditions or limitations that put them at higher risk of injury from exercise. The Physical Activity Readiness Questionnaire (PAR-Q), developed by the National Academy of Sports Medicine, is one method commonly used to screen individuals before engaging in physical activity (Adams, 1999; **Appendix B).** The self-report measure includes seven yes or no questions assessing whether or not individuals have certain high-risk factors, such as heart conditions, risk of stroke, or balance problems. If participants respond 'Yes' to any of the questions, they are advised to consult their doctor before participating in an exercise program.

Depending on participants' health conditions, you might want to require that they provide a letter or email from their healthcare provider approving their participation in the exercise class. Although this step can take time, the healthcare provider letter provides an additional level of confidence that participants can exercise safely. Additionally, it may be more efficient for smaller classes to bypass the PAR-Q and instead require all individuals to provide a healthcare provider letter before starting the class. You should establish what type of healthcare provider is appropriate (e.g., physician, physician assistant, nurse practitioner, physical therapist) for your specific program by considering the population and potential for risk.

To help make this request for approval as easy as possible, we recommend providing participants with key information about the exercise program (e.g., email, brochure, handout) to share with their healthcare provider.

The letter may include:

- Aims of research study

- The exercise program selected and rationale

- Brief description of how the sessions will be conducted and who will be moderating them

- What safety considerations/modifications will be put in place

- Contact information of instructor or, if it is part of a research study, contact information for the Principal Investigator, notice of IRB approval, and funding agency

Consent form or liability waiver

Before participating in a telewellness program, it is important that participants are fully informed about what to expect, including the potential risk of injury or harm. To help protect the class provider from potential claims or damages, it is advised that participants review and sign a form, such as a consent form or liability waiver, that indicates they are aware and assume the potential risks involved by participating. Given that telewellness classes are remote, we recommend offering flexible options for participants to provide consent, such as completing an online form, scanning a photo of a signed form, or recording verbal consent.

Trained instructors

Instructors should be well-versed in the program being offered so they can effectively teach, address questions, and provide modifications, as needed. For telewellness classes, instructors are unable to provide in-person adjustments so it is especially important that they provide verbal cues that guide participants through the exercise and help them adjust accordingly. Instructors for EBPs or other established programs should be trained and certified. It can be helpful for the instructor to create a cheat sheet of cues to reference during classes.

Non-instructor facilitators

For telewellness classes that use pre-recorded instruction, it is recommended that any non-instructor staff (e.g., facilitators) helping participants with the program review and familiarize themselves with the program in advance of class to be able to immediately offer support to participants, as needed.

Tele Tai Chi Case Study Example

Study facilitators completed a 2-day instructor training workshop to become certified instructors (see photo). Although our research staff are not teaching the tai chi classes, the developer of the program recommended that they become certified to be able to address any questions about movements, modifications, and safety guidelines. More information about the Tai Chi for Health program, as well as how to enroll and prepare for an instructor training workshop can be found here: https://taichiforhealthinstitute.org/how-to-become-an-instructor-of-dr-lams-program-3/

CLASS ORGANIZATION & LOGISTICS

Social Interaction

In addition to physical benefits, telewellness classes can provide an opportunity to engage in social interaction with other participants, allowing individuals to feel socially connected despite not being co-located. Physical activity programs with a social component serve as a great motivator for class participation and tend to have greater adherence (Ryan et al., 1997; Rhodes et al., 1999). Disability populations are at increased risk for social isolation and may therefore especially benefit from the peer support and community these remote classes can foster. Building in a discussion period can help establish rapport and facilitate relationships among participants.

Guidelines

We recommend that instructors provide guidelines to the class participants about various aspects of the class, including social interactions.

Some helpful guidelines pertaining to social interactions include:

- Be on time or early to be respectful of everyone's time
- Avoid cell phone usage or talking to others who are not in the class (e.g., a spouse who is co-located with the participant but not attending the class) to avoid disrupting others
- Mute yourself if necessary (e.g., your spouse is watching TV nearby) to avoid disrupting others
- Ground rules for discussion (e.g., topics that are off-limits)
- Permission to "pass" if uncomfortable discussing a topic

> **Tele Tai Chi Case Study Example**
>
> To facilitate social discussion in the Tele Tai Chi study, we have found it helpful to provide a Class Etiquette Guide for everyone to read ahead of the start of the program and review together every class (**Appendix C**). Its purpose is to make clear that the class is designed to be a safe space where the focus in on the exercise and how individuals are feeling. Everyone should be treated with respect, and foul language, medical advice, or discussion of religion or politics should be avoided.

Timing and topics

Instructors are encouraged to build in time at the beginning or end of classes for social time, and consider having a session facilitator to help guide the discussion. It can be helpful to prepare weekly discussion topics for social time ahead of class. These topics should be designed to provide an opportunity to help participants get to know each other and time to ask questions about the class.

Tracking who speaks during each class session will ensure everyone is given the opportunity to participate during social time. (Note: participants are always given the option to "pass", but it is important to engage every participant by name.) A workbook that tracks each session could be used to track class participation and weekly discussion topics.

> **Tele Tai Chi Case Study Example**
>
> During each Tele Tai Chi class, there is 10 minutes of social time before and after each exercise lesson. We developed a list of social time discussion topics for facilitators to use (See **Appendix D**). We included topic suggestions for pre-class, post-class, as well as list of backup questions if there is remaining time. However, we have found it is better to not force conversation or be too rigid if conversation is going well about another topic.

Technical Support

It is essential to keep in mind that participants may have different devices and knowledge about technology, including different levels of familiarity and proficiency with video conferencing; for some this could mean very minimal or even no prior experience. This is particularly important for older adults who may have less technology experience, in general. Be prepared to provide technical support (e.g., instruction manual, as needed support) to your participants, especially in the beginning. Providing a manual and an orientation and training session can help immensely.

Orientation

We recommend having a 1-on-1 virtual orientation before the program begins to ensure participants have the necessary technology setup to connect to the video conferencing platform and understand how to log into classes. This will provide an opportunity for the participant to practice logging into the software and for the researcher to evaluate the participant's capabilities and limitations (including needs for accommodation such as closed captioning). This time can be used to provide training, assess Wi-Fi bandwidth, optimize audio/video quality, review study materials, go over safety precautions (review any safety or readiness measures and/or environmental checklist), and answer any remaining questions they may have about the program or how to join the class. We have found it

especially helpful to briefly explain all the actionable buttons on the interface of the video conferencing software that they will be using during class (i.e., mute/unmute).

Tele Tai Chi Case Study Example

In the Tele Tai Chi study, we have a 1-on-1 orientation session with participants that starts on the telephone. The researcher provides step-by-step instructions of how to join Zoom, and makes sure they are successfully on the video call before hanging up. Once on Zoom, the researcher gives a tutorial on key Zoom features and functions, including how to:

- Mute/unmute audio

- Stop/start video

- View class participants

- Edit name

- Chat

- Leave the meeting

Support materials

We suggest providing support materials (e.g., class user guides, instructions for how to join the class using the software, and troubleshooting FAQs) to participants in advance of class so they have the time to review them beforehand. This may help mitigate technology issues that participants could experience during their first few classes.

To the extent possible, we recommend providing participants with resources to practice the exercises on their own during the program to help develop their confidence, including hard copy materials showing the exercise movements and access to any other content available (e.g., videos) to practice on their own.
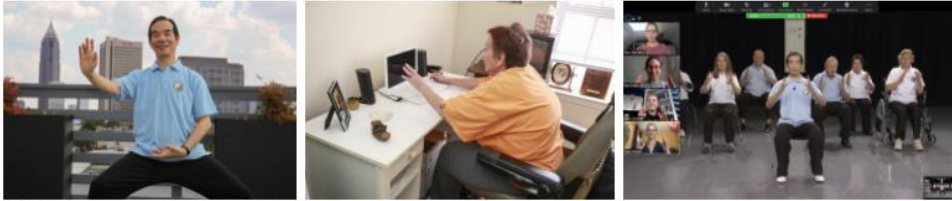
It is helpful to keep all study materials and resources in one place so they are easily accessible to participants to reference throughout the program. Hosting materials on a website can be a convenient way to share and update resources for participants. Some participants may prefer to have hard copies sent to them via mail, so it is helpful to ask what works best for them.

Tele Tai Chi Case Study Example

In the Tele Tai Chi study, we provide both the How to Join a Video Class on Zoom (**Appendix E**) and Zoom FAQs (**Appendix F**) as our user guides for participants. We reference these throughout the study and teach many of the technology features presented in the Zoom FAQ.

We created a Tele Tai Chi Study website (**Figure 3**) that serves as a central location for study materials and resources including: the consent form, contact information for the research team, Zoom support materials, and movement guides.

Figure 3. Screenshot of Tele Tai Chi study webpage.

Class Scheduling and Reminders

It is important to gauge your audience and understand their preferences for class times and reminders. Depending on the goals or design of the program, scheduling standing times for classes may be preferred. There are many options for scheduling classes including using online scheduling or hosting drop-in classes. One example of an online software is You Can Book Me (https://youcanbook.me), which enables you to share available time slots with participants so they can sign up to book classes and receive calendar-integrated reminders and notifications. Regardless of how classes are scheduled, email or text reminders the week of or the day before class may help to promote retention. For research studies that want to maximize adherence, researchers should follow-up with participants who miss class by phone or email. To build and maintain rapport with participants, we recommend that researchers use these touch points to let the participant know that they were missed in class and offer to help if they experienced any technical issues.

> *Tele Tai Chi Case Study Example*
>
> In the Tele Tai Chi study, we set a standing schedule for classes that meet twice weekly (e.g., Mondays and Wednesdays at 10am). We send a weekly reminder email at the start of the week, which includes the date and time of classes that week and a link to join the class on Zoom. The emails contain a link to the study webpage, which has all of the materials and support documents, including the instructions for how to join a video class on Zoom.

CLASS DESIGN

Safety

Modifications

It is important to remind participants at the beginning of every class that they should work within their own unique abilities, which may be different from their classmates or vary for themselves day-by-day.

Emphasize the following and consider providing it as a hand out:

Suggested Safety Reminders
- We are in this together, however your exercise session is YOUR exercise session   - Meet yourself where you are today   - Safety is a priority above all else   - Listen to your body   - You should not be in pain   - Take a break when you need it   - Work within your comfort zone and abilities

Instructors should develop scripts for common modifications for movements and encourage visualizing movements if participants are unable to perform them. For telewellness classes using pre-recorded (vs. live instruction), a welcome video may be helpful to introduce exercise modifications and reminders for safety. Alternatively, instructors can work with individuals on modifications in one-on-one sessions.

Consider repeating lessons and building off of previous lessons so participants can steadily learn. Emphasize to participants that it is okay if they are still learning how to do a movement or are unable to do certain movements. It is important to make clear that safety is the priority above all else. Lastly, at the end of the class, build in time to address any questions about movements or modifications. Instructors can demonstrate some movements to the participants over video at this time, as needed.

> ### *Tele Tai Chi Case Study Example*
>
> We created a Welcome Video (see **Figure 4**) narrated by a Master Trainer with the Tai Chi for Health Institute. The video provides an overview of the Seated Tai Chi for Arthritis program, what to expect in the study, and safety considerations specifically relevant to our study population. We encourage participants to watch the video, which can be found on our Tele Tai Chi Study webpage, in advance of their first class.

Figure 4. Screenshot of the Tele Tai Chi Welcome Video

Social Time

Class instructor/facilitator guidelines

For programs that have time built-in for social interaction, a class facilitator may be helpful to guide the discussion and make participants feel more at ease. This can be the class instructor or a support staff member.

Class Instructor/Facilitator Checklist

☐ Prepare your environment – lighting, etc. If you are seated, be sure to sit up straight and try not to swivel or rock in your chair.
 	
☐ Greet all participants as they enter the session. (Consider asking everyone if they are comfortable being referred to by their first name)
 	
☐ Remember to smile, as it will make participants more comfortable.
 	
☐ Some older adults may have memory and/or hearing challenges. When you ask a question:
   • Speak clearly and slowly
   • Give a long pause to give time for people to think and answer
   • Be mindful to not give more than 3 instructions at a time
 	
☐ Recognize achievements of participants ("This is your [insert #] class! Way to go!")
 	
☐ Welcome back participants who missed the last class
 	
☐ Remind them to make sure they have water ready
 	
☐ Remind them to make sure their phone or emergency device is within reach
 	
☐ Conduct a brief technology check asking participants individually if they can see and hear you

Social discussion guidelines for participants

Social guidelines for participants can help keep the conversation on track and give all individuals the opportunity to speak if they wish to. Class attendance and participation can be managed using a session tracking workbook. This can also be used to keep a record of what lesson you are on, a brief summary of what was covered during class, and discussion topics. Here are some helpful tips for facilitating social discussion in your telewellness class:

- Have all class participants practice muting and unmuting their microphones during the first few lessons to prevent echoing or other background noises become an issue. This can also help keep individuals from talking over one another.

- Remind participants every class that they always have the option to "pass" if they do not feel comfortable with the discussion topic, and that they can turn off their video during the social discussion if they would be more comfortable, or need to briefly step away to take a break.

- Encourage participants to use the chat feature to start their own group or one-on-one conversations. The chat feature is also a great way for participants to exchange contact information with one another if they want to connect outside of class.

> *Tele Tai Chi Case Study Example*
>
> Each Tele Tai Chi class has social time before and after the exercise lesson. The class facilitator guides discussion during social time and helps transition participants between social time and exercise. If there is active conversation when it is time for the exercise period, the facilitator reminds participants that they can finish the discussion after the exercise period. In the event the conversation does not follow the Class Etiquette guidelines (**Appendix C)**, the class facilitator should remind participants about the etiquette guide and redirect the discussion. Participants are encouraged to use the chat feature on Zoom to message the group or specific individual(s) privately.

Tech Settings and Support

Optimizing settings

Depending on what technology you choose to use and how you are delivering the program (e.g., live streaming or pre-recorded), you will want to determine what settings create the best quality user experience. This could be anything from adjusting the video resolution, turning on closed captioning, or even the use of external microphones

> *Tele Tai Chi Case Study Example*
>
> For the Tele Tai Chi study, we adjust the resolution of the video lessons being broadcasted to 540p, as we found this creates the balance between good video quality and no lag. We always use closed captioning to support any participants with hearing limitations. In Zoom, we use the 'share computer sound' setting when beginning screen-sharing as this directly shares the audio of our video lessons and avoids feedback from the microphone. Additionally, all participants are muted.
>
> Note. Broadcasted video may play at a lower volume than the group conversation on Zoom. We recommend letting participants know that they may need to turn up volume during the lessons.

Building in time for troubleshooting and teaching

In addition to doing a quick technology check at the beginning of each class to make sure each participant can see and hear you, it could be beneficial to build in time at the beginning of classes for troubleshooting as some may struggle with technology issues, especially early on in the program as they may be learning a new software. As participants become more comfortable joining the class, this time may be a good opportunity to review some basic skills, such as using the mute/unmute or hide/unhide video features, or to teach some new technology skills. Once you feel your participants are comfortable with the basics, the following additional skills may be useful to teach:

- Bookmarking the lesson page on a browser
- Changing the view on Zoom during the video lesson (gallery vs. speaker view)
- Using Zoom reactions (e.g., thumbs up, applause) which may be a fun way for participants to engage during social time while someone else is speaking
- Changing Zoom backgrounds (e.g., ocean view, solid color)
- Go over technology FAQs

Tech moderator

Depending on the class size, it may be difficult for the class facilitator to simultaneously manage the session and any technical issues that can arise. Therefore, you may want to have an additional support staff member to act as a tech moderator, whose role is specifically to handle the technical side of a class. This would alleviate some of the tasks and stress put upon the class instructor/facilitator, so they are more able to focus on leading the class.

Responsibilities of the tech moderator could include:

- Recording start/end times of session
- Keeping track of participant attendance
- Attending to technical issues that occur during the session
- Taking notes of what happens during the session
- Streaming pre-recorded video to class

Ways to incorporate a Tech Moderator in the class:

- Tech moderator comes on screen to introduce themselves and sends a chat message to everyone with their contact information (phone and email). Asks that anyone with tech issues or tech questions send them a private message in the chat (or call/email) and briefly instruct how to private message
- Facilitator can send a private chat to the tech moderator letting them know that a participant seems to be having technical challenges. The tech moderator can contact them to assist

Using the chat feature is an important skill to teach, especially as a mode of communication between participants and the tech moderator. Most chat boxes have the option to message the group or to send a private message to an individual in the meeting. Teaching participants how to privately message the tech moderator if a technical issue or question arises would keep the conversation from disrupting the flow of class and potentially distracting other participants.

Tele Tai Chi Case Study Example

In the Tele Tai Chi study, our tech moderator is in charge of monitoring the chat for tech issues (while also being available for calls/emails) to troubleshoot any issues that arise. The tech

moderator is also in charge of screen-sharing the pre-recorded video lessons to the class. This includes adjusting the settings for a lower resolution and turning on captions for each portion of the video. They are also responsible for filing out a session tracking workbook for every class that includes details such as start/end times and a checklist of tasks to be completed during each class (e.g., lesson number, discussion topic, attendance).

Getting Feedback

At the conclusion of your telewellness class, you may want to get feedback from class participants. Satisfaction with the class, instruction quality, and concerns are just a few of the topics you might want to assess from class participants. An online, post-class survey that is brief and easy to complete is an ideal way to elicit participant feedback in an automated way. There are a variety of survey platforms that can be used to create a post-class survey, including free options such as Google forms and Survey Monkey, as well as paid programs, like Survey Gizmo and Qualtrics.

Tele Tai Chi Case Study Example

At the end of each Tele Tai Chi class, tech moderators send the post-class survey link, developed in Qualtrics, in the Zoom chat box and encourage participants to complete it. The post-class survey asks participants about: any technical issues they had (open-ended), how much they enjoyed the class (5 point scale from 'not at all' to 'very much'), if they are comfortable moving on to the next lesson, how calm they feel, (10 point rating scale from 'not calm at all' to 'very calm'), and how many times they have practiced tai chi on their own, outside of designated class times, since the last class. **Figure 5** includes example questions in the post-class survey. Participants who do not complete the survey within 15 minutes of class are sent a follow-up email with the survey link again.

Additionally, at the end of the 8-week program, participants complete a post-study questionnaire which includes modified, select items from the Physical Activity Class Satisfaction Questionnaire (PACSQ; Cunningham, 2007); items represent 5 different dimensions including: mastery experience, interaction with others, teaching, improvement of health and fitness, & relaxation. See **Figure 6** for example PACSQ questions featured in the Tele Tai Chi post-study questionnaire.

On a scale of 1-10, how calm do you feel?

1 Not Calm at all	2	3	4	5	6	7	8	9	10 Very Calm

Since the last class, how many times have you practiced tai chi on your own?

Never

Once

Twice

Three or more times

Figure 5. Example post-class survey questions from the Tele Tai Chi study.

Thinking about the Tele Tai Chi program, how satisfied were you with the following:

The opportunity to learn new skills.

1 Not Satisfied	2	3	4	5	6	7	8 Very Satisfied	Do not wish to answer

The degree to which I improved on particular skills.

1 Not Satisfied	2	3	4	5	6	7	8 Very Satisfied	Do not wish to answer

Figure 6. Example modified questions from the Physical Activity Class Satisfaction Questionnaire (PACSQ; Cunningham, 2007) featured in the Tele Tai Chi post-study questionnaire

SUMMARY

Group-based exercise and wellness classes hold great potential to support the physical and mental health of older adults with disabilities. However, barriers exist for many to attend such classes in-person, particularly those who are aging with disabilities. The goal of this tool is to provide guidelines and considerations for delivering remote telewellness classes to older adults with disabilities, from the initial planning to executing a class. The suggestions contained in the tool were informed by our experience developing and conducting a Tele Tai Chi program as a part of a clinical trial. The guidelines and considerations are intended to make the classes more accessible for the participants and easier to deliver for the instructor, with the ultimate aim of supporting the wellness of older adults who are aging with disabilities.

REFERENCES

Adams, R. (1999). Revised Physical Activity Readiness Questionnaire. *Can Fam Physician*. 45, 992-1005.

Administration on Community Living. (2019, April 3). *Health Promotion*. https://acl.gov/programs/health-wellness/disease-prevention

Callahan, L. F., Cleveland, R. J., Altpeter, M. and Hackney, B. (2016). Evaluation of tai chi program effectiveness for people with arthritis in the community: A randomized controlled trial. *Journal of Aging and Physical Activity, 24*, 101 -110.

Cunningham, G. B. (2007) Development of the Physical Activity Class Satisfaction Questionnaire (PACSQ). *Measurement in Physical Education and Exercise Science, 11*(3) 161- 176.

Fransen, M., Nairn, L., Winstanley, J., Lam, P., Edmonds, J. (2007). A randomized control trial of 200 subjects comparing tai chi, hydrotherapy and control, to measure improvement in pain, physical function, muscular strength and walking capacity. *Arthritis Care and Research, 57*(3), 407-414.

Guillot, A., Collet, C., Nguyen, V. A., Malouin, F., Richards, C., & Doyon, J. (2009). Brain activity during visual versus kinesthetic imagery: An fMRI study. *Human Brain Mapping*, *30*(7), 2157-2172. doi:10.1002/hbm.20658

Klempel, N., Blackburn, N. E., McMullan, I. L., Wilson, J. J., Smith, L., Cunningham, C., O'Sullivan, R., Caserotti, P., & Tully, M. A. (2021). The effect of chair-based exercise on physical function in older adults: A systematic review and meta-analysis. *International journal of environmental research and public health*, *18*(4), 1902. https://doi.org/10.3390/ijerph18041902

Marusic, U., Grosprêtre, S., Paravlic, A., Kovač, S., Pišot, R., & Taube, W. (2018). Motor imagery during action observation of locomotor tasks improves rehabilitation outcome in older adults after total hip arthroplasty. *Neural Plasticity*, https://doi.org/10.1155/2018/5651391

National Council on Aging. (n.d.). *About Evidence-Based Programs*. https://www.ncoa.org/center-for-healthy-aging/basics-of-evidence-based-programs/about-evidence-based-programs/

Rhodes, R.E., Martin, A. D., Taunton, J.E., Rhodes, E.C. Donnelly, M. & Elliot, J. (1999). Factors associated with exercise adherence among older adults: An individual perspective. *Sports Med, 28* (6), 397-411. https://doi.org/10.2165/00007256-199928060-00003

Ryan, R. M, Frederick, C.M., Lepes, D., Rubio, N. & Sheldon, K.M. (1997). Intrinsic motivation and exercise adherence. *Int. J. Sport Psychol, 28*, 335-354.

Voukelatos, A., Cumming, R. G., Lord, S. R. & Rissel, C. (2007). A randomized, controlled trial of tai chi for the prevention of falls: The central sydney tai chi trial. The American Geriatrics Society, 55(8), 1185–1191.

Appendix A. Environmental Checklist (Tele Tai Chi study)

	YES	NO
[OBSERVATIONAL – for Researcher to fill out]		
Is there good lighting in the room? (Can the participant clearly be seen in the camera?) If yes, looks like you have good lighting in the room. Great setup! If no, ask if there another light they could turn on or a way they could make the room brighter? Turning up brightness on screen		
Is the room quiet? (no background noise like air conditioning, fan, etc.) If yes, Great, I don't hear any background noise and I'm able to hear you clearly. If no, I'm having some having some trouble hearing you clearly. *Offer suggestions if you identify background noise (e.g., radio, TV, open door).		
Instructions: Answer the following questions to ensure that you have the best possible environment for participating in seated Tele Tai Chi. Please respond with Yes or No.		
Are you sitting in a sturdy chair or wheelchair? *It is ok if the chair has arms if you prefer to have them. If yes, Great! If no, is there another chair available that you could use? For your safety, chairs that can easily move or are on wheels are not recommended.		
Is there a flat surface where you can place the computer or tablet with the webcam? (e.g., desk, table) If yes, Great! If no, is there another location in your house where this is available? Or perhaps another table that could be used?		
Do you have enough space between yourself and the camera to move your arms at full length without hitting anything? (about arms distance from the table). If you		

	YES	NO

are able, can you please extend your arms forward toward the screen & to the side.
 	
    If yes, Great!
 	
    If no, is it possible to move or clear off any of these obstacles? Perhaps another location in your house?		

Is the floor directly around you free of clutter? (Cords pushed back against the wall)
 	
    If yes, Great!
 	
    If no, is it possible to move some of those items out of the way?		

In case of emergency, do you have a phone or alert device within reach?
 	
    If yes, Great!
 	
    If no, that's for right now, but for the study, we want all participants to have a phone or alert system nearby.		

Appendix B. Physical Activity Readiness Questionnaire (PAR-Q)

	Questions	Yes	No
1	Has your doctor ever said that you have a heart condition and that you should only perform physical activity recommended by a doctor?		
2	Do you feel pain in your chest when you perform physical activity?		
3	In the past month, have you had chest pain when you were not performing any physical activity?		
4	Do you lose your balance because of dizziness or do you ever lose consciousness?		
5	Do you have a bone or joint problem that could be made worse by a change in your physical activity?		
6	Is your doctor currently prescribing any medication for your blood pressure or for a heart condition?		
7	Do you know of any other reason why you should not engage in physical activity?		

Note. Adams (1999). *If participants answer "Yes" to one or more of the above questions, instruct them to consult their physician before engaging in physical activity.*

Appendix C. Class Etiquette Guide

Pay Attention: Avoid cell phone usage or excess talking during video chat. During tai chi lessons, the more you pay attention, the easier the class will be.

Be positive: Don't get discouraged. Most participants are probably feeling the same way you are. Know your limits and only do what you are capable of doing. Stick with it and the moves will become easier the more comfortable you are with doing them. Make sure to ask for help when you need it though.

Be on time: Give yourself time to set up your webcam and laptop that way you won't miss anything.

Come by yourself: To respect the privacy of your fellow classmates enrolled in the study, please plan to attend the class without the presence of others.

> *We understand that you may want to share the tai chi lessons with friends and family. You will have the opportunity to share the program after the 8-week session.*

Dress comfortably: You will be moving so make sure to wear something comfortable that allows for movement.

Respect others: Everyone is here to learn, so treat all fellow participants with courtesy, kindness, and respect.

Ground Rules for Discussion:

- No foul language
- No medical advice
- Avoid topics such as politics, religion, etc.

It's Okay to "Pass": If you find a discussion uncomfortable or not something you wish to talk about, it's okay to simply "pass" on the conversation. You are not required to discuss anything if you do not wish to.

Appendix D. Social Time Discussion Topics

<u>Pre-Class Topics</u>

- Introduce yourself (first name)
- What do you like to do for fun or what is your favorite hobby?
- Personal geography – Where you from? Where did you grow up? Where do you live now?
- What do you like and/or dislike about physical exercise?
- What kinds of physical activity do you enjoy doing?
- What are your personal goals for taking this class (e.g., improve fitness, do certain activities)?
- What challenges do you have with physical activity outside of class, or with the lessons from class?
- What keeps you motivated?

<u>Post-Class Topics</u>

- How are you feeling? What is 1 word that describes that feeling?
- How did the second time going through the lesson compare to the first for you?
- How do you feel now compared to before class?
- Do you have any questions about the movements or concepts that I have discussed during class?
- Is there a topic that you would like to discuss as a group?

<u>Backup Question Topics</u>

- What is something that made you smile lately?
- What is the favorite place you have ever visited?
- What is your favorite meal?
- What is something you are grateful for?
- What is your favorite childhood or current game?
- What book or tv show are you reading/watching right now?

Appendix E. How to Join a Video Class on Zoom

1. Access Zoom video class. You can access the class by clicking on the Zoom link emailed to you.

2. If a download doesn't automatically start, you should click the "download and run Zoom" button.
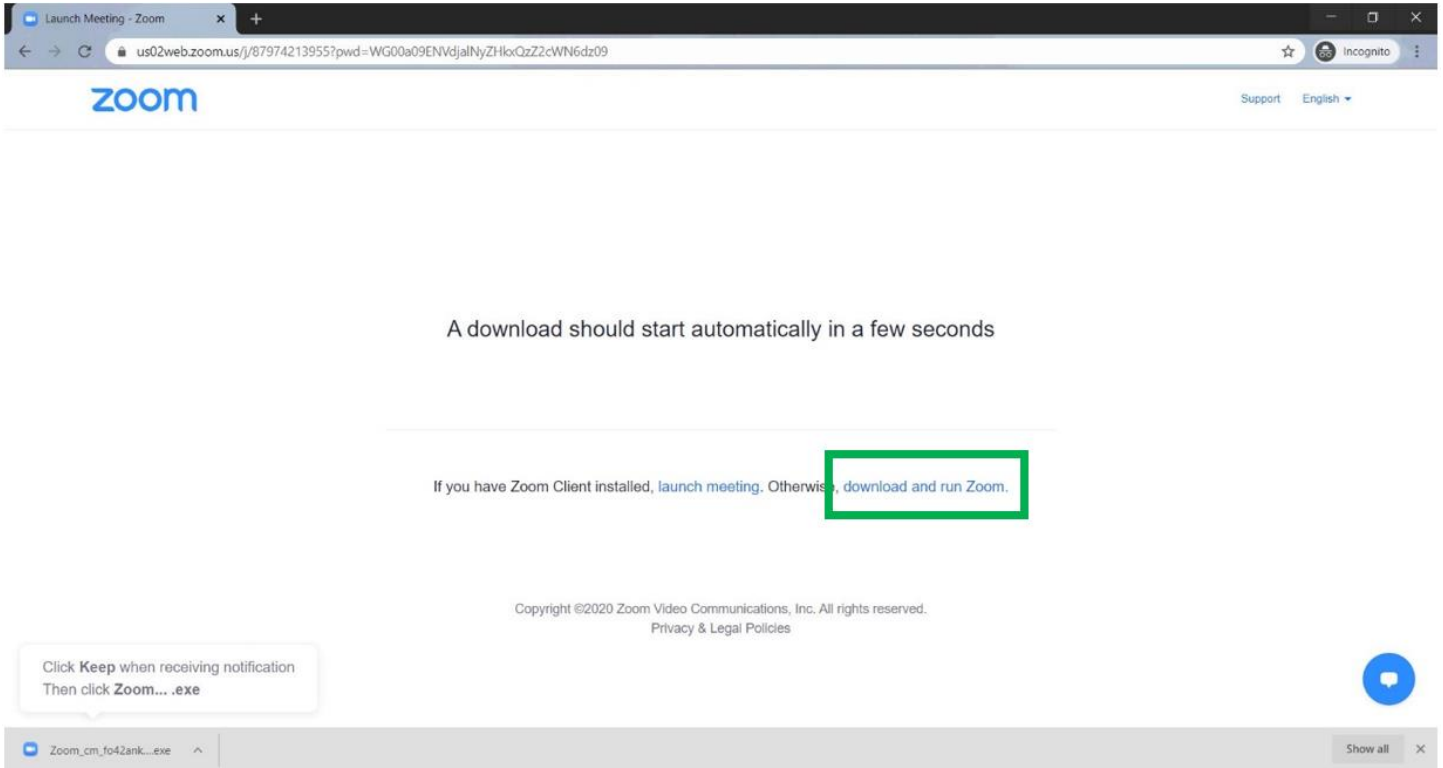
3. Once the download is complete, Zoom should automatically open on your screen. If the app does not open, click on the launch meeting button.
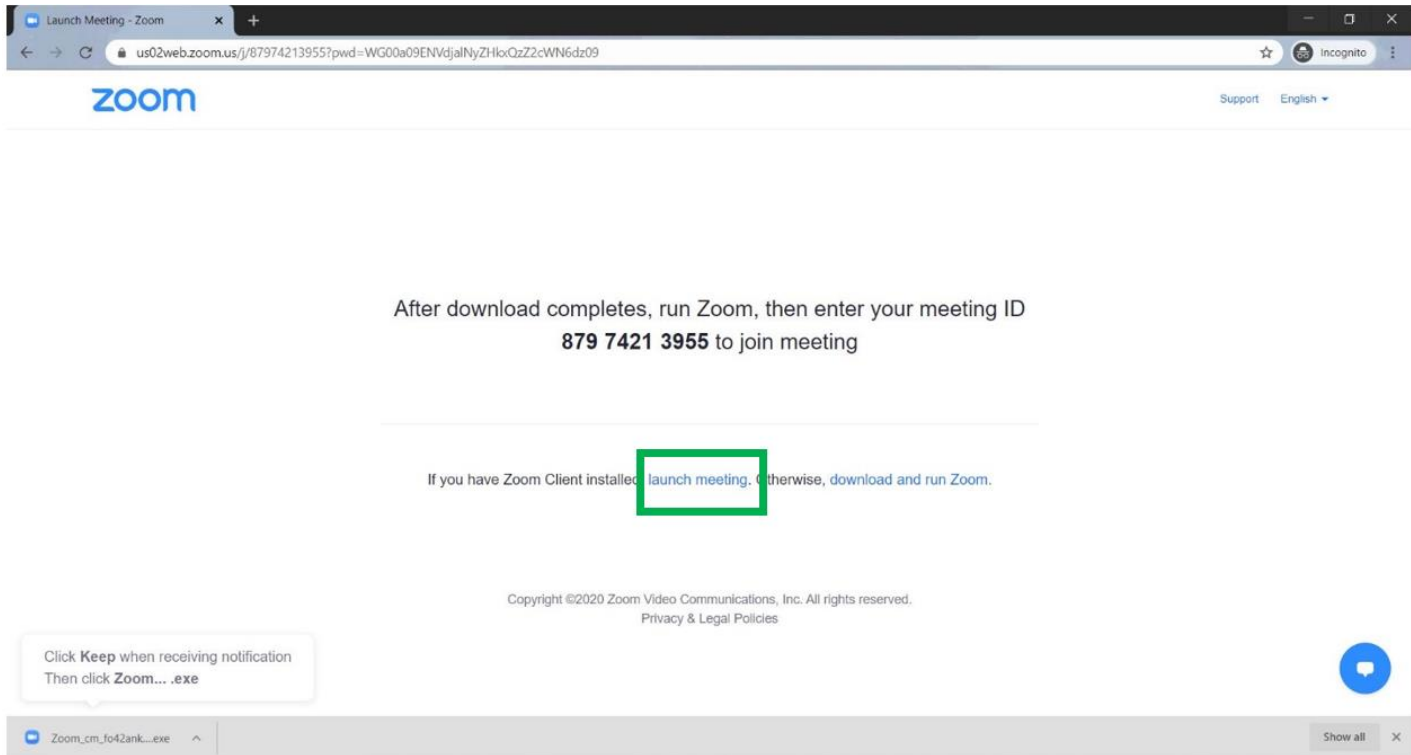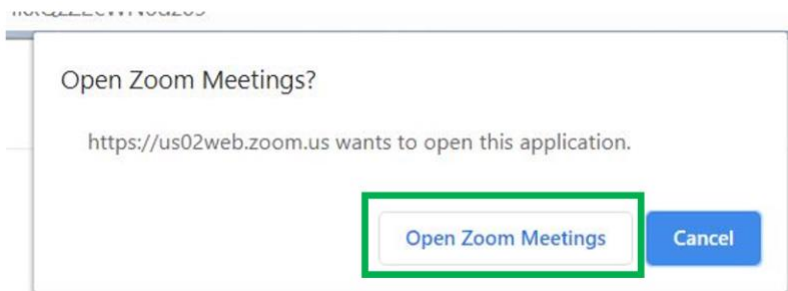
4. If you are unable to download/launch Zoom, an option to open the class in your browser should appear. Feel free to select this option.
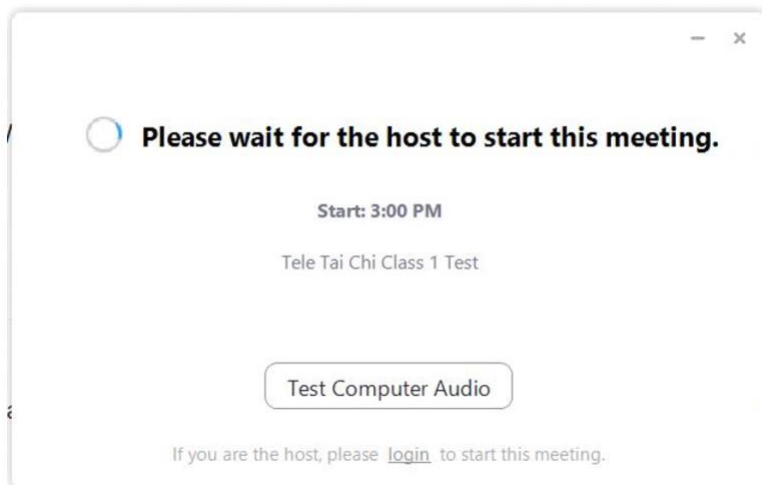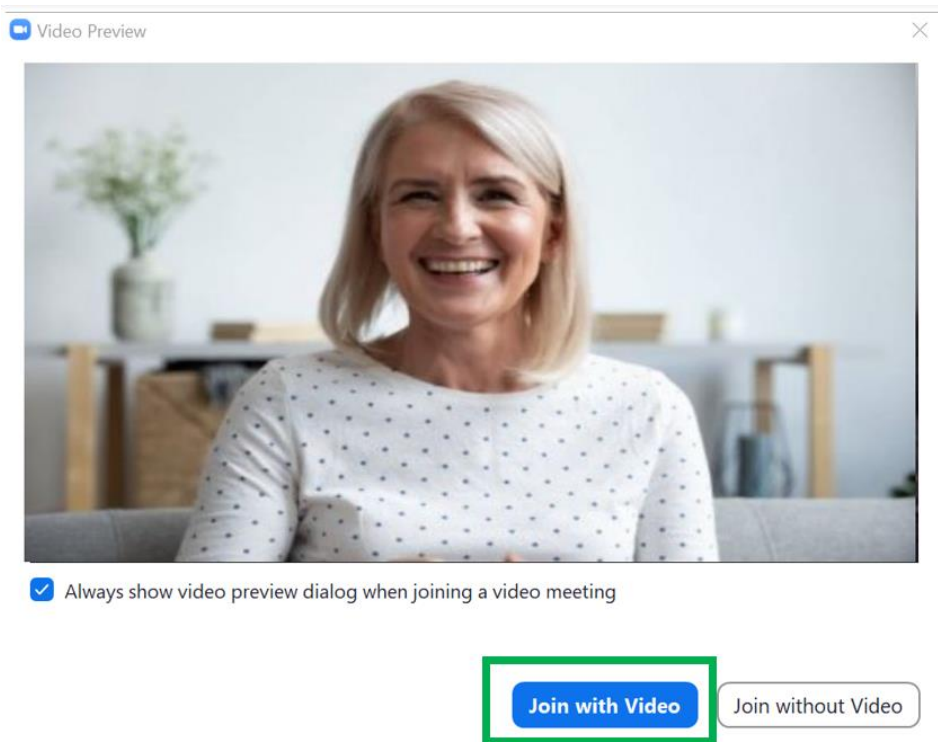

5. Once you click "launch meeting", a message may pop up like the one below asking if you would like to open Zoom. Click on the button that says, "Open Zoom Meetings".


6. If the class has not started yet, you will get a pop-up on your screen like the one below. Just wait for the host to start the class.

Please wait for the host to start this meeting.

Start: 3:00 PM

Tele Tai Chi Class 1 Test

Test Computer Audio

If you are the host, please login to start this meeting.

7. Once the class starts, the application will prompt you to join with your video on. Select the blue button that says "Join with Video" if you would like everyone in the class to see you.


Video Preview

☑ Always show video preview dialog when joining a video meeting

Join with Video   Join without Video

8. The application will also prompt you to turn your audio on so you can be heard. Click on the button that says, "Join with Computer Audio".
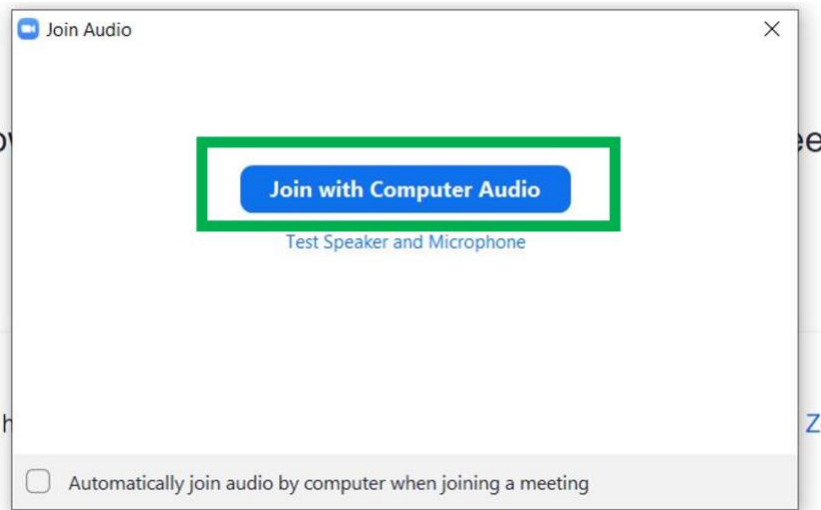
9. Mute/Unmute Audio: If you do not wish to be heard, you can mute your audio by clicking the button that says "Mute" in the bottom left corner of your screen. You can turn your microphone back on by clicking the button again.

10. Hide/Unhide Video: If you do not wish to be seen, you can hide your video by clicking the button that says "Stop Video" in the bottom left corner of your screen right next to the mute button. You can turn your camera back on by clicking the button again.
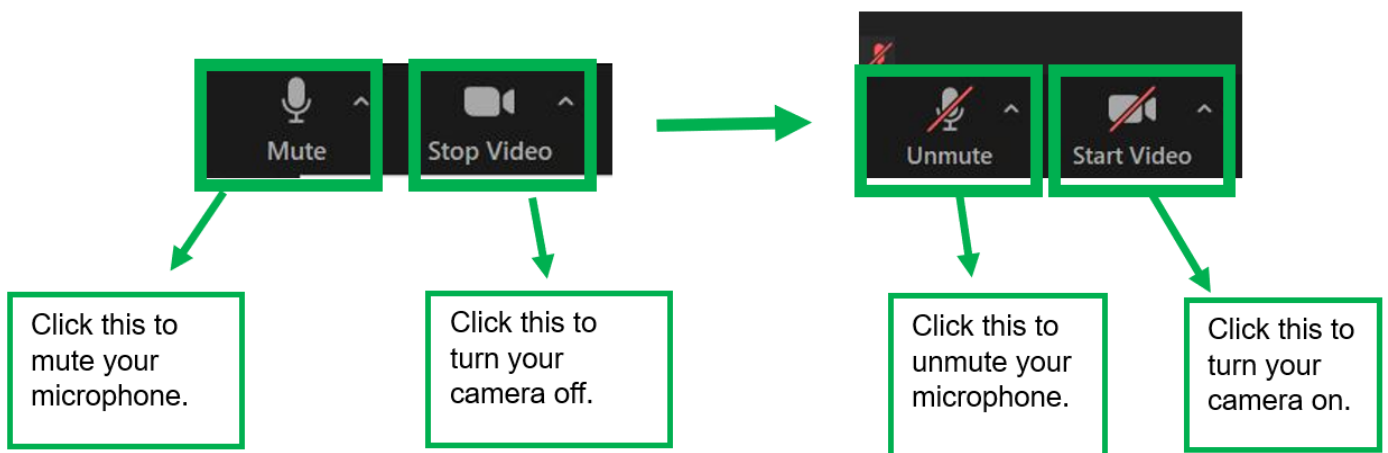

11. **Send a chat**: To send a chat, click on the button that says "Chat" at the bottom of your screen.
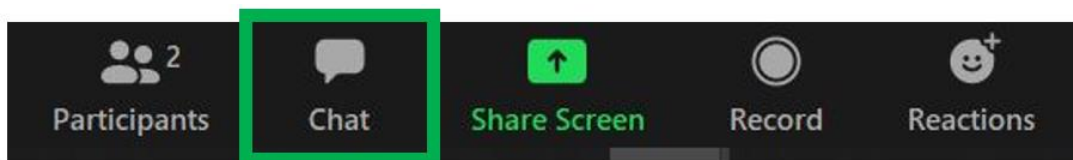
Type your message where it says, "Type Message Here…". You can send your message to everyone in the class or to a specific person (like the tech moderator if you have any technical difficulties). To indicate who you would like to send your message, next to the word "To:" there is a drop-down box

that if you click will show you everyone in the class. Just click on who you would like to send you message and then press enter on your keypad to send to the person selected. Or you can select everyone to send to the whole class.

Click here to select who you would like to send your message to.

To: Everyone ⌄   🗋 File   ⋯

Type message here...
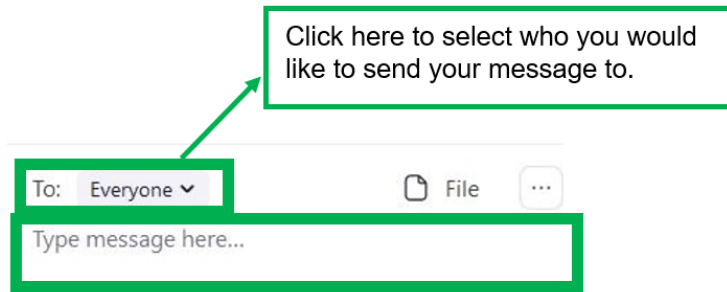
Appendix F. Zoom FAQs

Video Walkthrough of Joining a Class

Click link above for a video walkthrough of joining a class on Zoom.

Attendee Controls in a Meeting

Click link above for a brief explanation of all controls displayed to you during class, including mute/unmute, start video/stop video, participants, share screen, chat, record, and leave.

Click this link for a more in-depth video explanation of controls:
https://www.youtube.com/embed/ygZ96J_z4AY?rel=0&autoplay=1&cc_load_policy=1

FAQs on Zoom Website

https://support.zoom.us/hc/en-us/articles/206175806-Frequently-Asked-Questions

Click link to view answers to the questions below.

Getting started with Zoom

- Where do I download the latest version of Zoom?
- How do I use Zoom on my PC or Mac?
- Do you need an account to use Zoom?
- How do I signup for Zoom?
- How much does Zoom cost?

Joining a Meeting

- How do I join a Zoom meeting?
- How do I join computer/device audio?
- Can I Use Bluetooth Headset?
- Do I have to have a webcam to join on Zoom?