RESEARCH

A Practitioner's Guide to Creating Multimedia Simulated Instruction for Students with Intellectual Disability

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Abstract
Students with intellectual disability benefit from direct instruction of community-referenced skills. Community-referenced skills are frequently taught through community-based instruction (CBI) however, CBI presents logistical barriers that can be difficult. Multimedia simulated instruction (MMSI) combines visual, auditory, and interactive elements to simulate real-world scenarios, providing a dynamic and engaging learning experience. This paper presents a framework for practitioners to develop MMSI that addresses the unique cognitive and learning needs students. A seven-step blueprint to creating MMSI, with careful and practical considerations given at each step, is presented with an illustrative scenario to demonstrate the practicality of MMSI. Key steps include deciding which skills to teach and the components of MMSI, analyzing transportation and logistical barriers, creating the materials and progress monitoring tools, and considering multimedia simulated components of the intervention. The paper emphasizes the benefits (cost, time, replication) of MMSI for both the student and practitioner.
Keywords: intellectual disability, multimedia instruction, framework

Special education teachers serving transition-level youth with intellectual disability must frequently teach community-referenced skills. Community-referenced skills include those skills needed for students to live independently and successfully complete postsecondary education. These skills may include purchasing skills, identification of community signs, grocery skills, public transportation use, social skills, and food ordering skills. As the need for independence increases with age, students with intellectual disability who are nearing the transition from school to independent living must be taught community-referenced skills through individualized instruction.

For some, the postsecondary transition marks a rite of passage with a promise of freedom and independence. Yet for students with intellectual disability, the transition to life after high school can be difficult if they are not properly prepared. A new beginning and lack of structure previously provided by formal education can elicit negative outcomes for students with intellectual disability. Indeed, students with

disabilities face the poorest postsecondary outcomes compared to any other minority group (Hiersteiner et al., 2016). Students with intellectual disability are more likely to be victims of crime and taken advantage of in sexual and social situations than typically developing peers (Hiersteiner et al., 2016).

In 2001, the US Department of Education funded the National Longitudinal Transition Study- 2 (NLTS-2) to examine postsecondary outcomes for students with disabilities. More than 11,000 students with disabilities were surveyed, along with their parents. Data from the NLTS-2 suggested that students with disabilities have more difficulty with language comprehension, poor academic achievement, problems with personal living and community skills, and less financial independence than their peers without disabilities. Results from the NLTS-2 suggested that students with intellectual disability reported feeling depressed and lacking confidence in themselves and their academic abilities. Additionally, results suggested that students with intellectual disability have poor social skills two to three years after graduation compared to their peers (Bouck & Joshi, 2016). These results are similar to more current studies which suggest students with disabilities have poorer social skills when compared to the social skills of their same-aged peers (Frye, 2018; Lang & Sturmey, 2021).

Social skills are learned skills we use to communicate with others. They include both verbal and nonverbal forms of communication. While social skills are important for all students, students with disabilities often have social skills deficits, in which they have difficulty acquiring or retaining the skills needed for successful socialization. Social skills include making conversation, understanding body language and gestures, making eye contact, understanding emotions, safety skills, and following social rules. Students can overcome social skills deficits with direct, systematic training that provides feedback, reinforcement, modeling, role-play, and more recently, video modeling (Fox et al., 2020; Godish et al., 2017; Mailey et al., 2021).

Community-Based Instruction (CBI)

Community-referenced skills are one type of social skill that includes skills needed to be successful in the community. Learning community-referenced skills can be advantageous for students and can improve outcomes for students with disabilities. Community-referenced skills are frequently taught through community-based instruction (CBI). CBI uses the community or natural setting as the classroom (Almalky, 2018). The objective of CBI is to provide meaningful learning experiences for students with disabilities to practice the skills in the environment they would occur. This type of instruction also helps promote the generalization of skills to other settings and allows for direct and immediate corrective feedback and teaching. CBI has been successful in teaching several skills, including purchasing skills (Xin, 2005), employment skills (Horn et al., 2020), banking (Barczak, 2019), and community safety skills (Trevor, 2021).

With the Corona Virus Disease-19 (COVID-19) impacting CBI across the nation, many districts halted CBI for the safety of students. While this presented a significant barrier to CBI and teaching community-referenced skills, even before the COVID-19 shutdown schools faced barriers to implementing CBI. These barriers included a lack of appropriate funding, limited resources, and constraints of No Child Left Behind (NCLB) and Every Student Succeeds Act (ESSA). Additionally, insufficient staff, transportation barriers, and logistical requirements were also reported to interfere with effective CBI (Rooney-Kron & Dymond, 2021).

Teachers also feel pressure to juggle CBI with other academic requirements. Rooney-Kron and Dymond (2021) surveyed special education teachers about potential barriers to CBI experiences. The common barriers reported by teachers included lack of opportunities, resources, time, and key stakeholder support. Over 50% of respondents reported barriers with transportation, logistics, staff, and funding as the key reason for limited CBI. Also, teachers reported that lack of financial support and support from the administration limited the types of CBI offered (Dymond, 2020). Almalky (2018) reported similar barriers to implementing CBI among teachers in Saudi Arabia, noting concerns for administrative support, liability concerns, and logistical issues as key barriers to implementing CBI

effectively. With special education classes becoming increasingly diverse, teachers find challenges to selecting appropriate CBI to meet the needs of all students (Hopkins & Dymond, 2020). Teachers must consider the extent to which CBI reduces the amount of time spent inside the general education classroom and weigh the pros and cons of teaching fewer academic skills and more community-referenced skills (Dymond, 2020; Test et al., 2017).

Multimedia Simulated Instruction (MMSI)

An alternative to CBI is multimedia simulated instruction (MMSI), which is designed to expose learners to an approximation of a natural setting to teach skills with the goal of improving independence in natural settings (Rowe et al., 2011). As technology is an emerging tool used in 21st-century classrooms, it seems appropriate that educational interventions incorporate modern technology as well. MMSI is presented via a computer, tablet, or mobile device and provides a dynamic and evidence-based framework for teaching students with intellectual disability. MMSI includes elements that present salient characteristics of community sites in presentation slides, photographs, video clips, audio clips, and/or recorded voice descriptions. MMSI can also include tangible materials, including flashcards, storyboards, checklists, and other interactive elements.

Grounded in principles of applied behavior analysis, experiential learning, and universal design for learning (UDL), MMSI allows educators to create structured, repeatable, and interactive learning environments that mirror real-world tasks in a controlled setting. This approach supports the acquisition and generalization of academic, vocational, and adaptive skills by providing students with immediate feedback, visual and auditory cues, and opportunities for guided practice without the social or safety risks of in vivo instruction. The multimodal nature of MMSI—integrating video modeling, animation, and interactive components—caters to diverse learning needs and supports cognitive processing by breaking complex skills into manageable, observable steps. In today's schools, where technology integration and inclusive education are priorities, MMSI offers a valuable bridge between traditional instruction and authentic skill application, empowering students with intellectual disability to engage more independently, build confidence, and transfer learned behaviors to real-life contexts. Previous research has demonstrated that various skills can be taught using MMSI, including purchasing skills (Burckley et al., 2014; Goo et al., 2016); ATM skills (Scott et al., 2013; Kang & Chang, 2020), safety skills (Akmanoglu & Tekin-Iftar, 2011; Carlile et al., 2018; Abadir et al., 2021; Bell, 2021; Simmons et al., 2023), cooking skills (Wu & Tsai, 2023), pedestrian skills (Dixon et al., 2020), car washing skills (Lo at al., 2024), and social skills (Yakubova & Taber-Doughty, 2013; Walker et al., 2016; Almumen, 2024).

Unique to MMSI, the created materials can be used repeatedly. While the initial time investment required to create and develop MMSI can be a barrier to its selection for use, the ease and efficiency of recycling materials and videos repeatedly outweighs the initial development concerns. Additionally, collaboration with other teachers to develop multiple MMSI materials allows for teaching many skills. MMSI also supports improved student engagement and motivation, as the use of MMSI captures students' attention and embraces individual learning interests (Bippert & Harmon, 2017). MMSI also provides students with tailored, individual learning experiences that incorporate multi-sensory instruction through visual, auditory, and kinesthetic elements to support student learning (Barczak, 2019). Appendix A highlights literature that examines the use of MMSI including the materials needed, implementation procedures, and practical considerations for practice.

While developing any intervention might seem overwhelming at first, the creation of MMSI can be done by considering seven simple steps. When considering each step, practitioners must ask themselves a series of questions, with the answer to each question guiding the development of the next step. Table 1 highlights the seven steps to developing MMSI.

Following Table 1, an illustrated scenario is presented to demonstrate the purpose and practicality of each step. While the scenario is hypothetical, it serves as a framework for practitioners wishing to create MMSI. By breaking this seemingly large task into several, more

manageable steps, practitioners can collaborate and consider the unique elements of their own intervention plan. At each step, emphasis is always placed on the unique and individual needs of the student.

Table 1

Seven Steps for Developing Multimedia Simulated Instruction (MMSI)

Steps for Developing MMSI	Questions to Consider
1. Determine which skill to teach. (Mechling & O'Brien, 2010)	What skills do students need to be taught? Can this skill be taught using multimedia simulated materials and settings?
2. Decide if using MMSI solely or in conjunction with CBI? (Hopkins & Dymond, 2020; Rooney-Kron & Dymond, 2021)	Can you go off campus for instruction? Can the skill be only taught in a multimedia simulated setting, with generalization occurring in the community or must it be taught in-vivo?
3. Consider the multimedia simulated components of the instruction. (Bell, 2021; Test et al., 2017)	Will the instruction be solely multimedia simulated or multimedia simulated along with CBI?
4. Develop the materials needed for MMSI. (Gardner & Wolfe, 2013)	What relevant stimuli and responses from the community are needed? What multimedia materials will be used (e.g., videos, audios, and photographs)?
5. Check if other support is needed. (Trevor et al., 2021)	What additional instructional strategies may be needed? What other supports (e.g., additional technology, visual prompts, etc.) are needed?
6. Develop instructional strategies for CBI (if using). (Burckley et al., 2014; Carlile et al., 2018; Yakubova & Taber-Doughty, 2013)	How often will instruction occur in the community? How often will data be gathered?
7. Create probes across settings. (Trevor et al., 2021)	How will data be collected in the multimedia simulated setting? How will data be collected in the community setting?

Illustrated Scenario

Step 1: Determine Which Skill to Teach. Within the first step to creating MMSI, practitioners must determine which skill to teach. When considering what skill to teach, it is necessary to consider the unique needs of the students in the classroom. Practitioners should consider the skills students lack for postsecondary success, keeping in mind the cognitive, developmental, and mobility needs of the classroom. Is the desired skill practical? Which skills do my students lack? During the initial planning stages, practitioners should consider conducting ways to incorporate MMSI into pre-existing Individualized Education Plan (IEP) goals and objectives (Mechling & O'Brien, 2010). It might be necessary for practitioners to begin with a foundational skill that is considered a building block to a more difficult skill. For example, if a practitioner wants to teach interview skills, introductory skills such as making eye-contact or using an appropriate greeting might need to be taught prior to teaching a student how to dress for the interview (Walker et al., 2016). Practitioners should consider conducting a needs assessment or observing students to see which

skills are lacking.

Practitioners should also consider the functionality of MMSI within their current educational setting and ask themselves if the skill can be achieved through MMSI, as not every skill can be acquired through MMSI (Almalky, 2018). For example, teaching someone to swim would be difficult to teach through MMSI, as the student would need to be in the water during instruction. Teachers will need to consider the classroom environment and needs/tool associated with teaching the skill to determine if it can be taught in their specific setting. Other skills, such as social and safety skills, are appealing topics for MMSI, as they can be easily and quickly taught through multimedia simulated instruction (Bell, 2021). If, after considering and selecting the skill, the practitioner believes it lends itself to MMSI, they should move on to step two.

Clara is an eleven year-old student with Mild Intellectual Disability. Her teacher, Mrs. Ford, has noticed Clara becoming increasingly more social with students and visitors inside the classroom. Not only is she talking more, Clara is becoming more affectionate with teachers and classmates by hugging them or holding their hand. Clara's mother has recently reported that she approached a stranger last week and gave him a hug in the grocery store. Clara has been asking more about relationships with others and has shown interest in having a boyfriend. Clara's mother is concerned about her increased affection towards others, especially strangers. After consulting with Clara's art and P.E. teachers, Mrs. Ford believes this is a new behavior occurring across settings. Mrs. Ford recently read an article about MMSI and decided that Clara interacting with strangers is a safety concern and a skill that can be addressed through MMSI. When considering her classroom, Mrs. Ford also believes other students would benefit from learning how to respond to stranger.

Step 2: Decide if Using Solely MMSI or MMSI in Conjunction with CBI. Step two involves deciding on the key instructional components of the intervention. Practitioners should consider if the intervention will consist solely of MMSI or a combination of MMSI with CBI. Practitioners should consider transportation, mobility, and location barriers to successfully incorporating MMSI and CBI into one intervention, as some educational settings do not support the ability to go off-campus for CBI (Hopkins & Dymond, 2020). For example, students in rural settings might not have access to a community store or public transportation. Therefore, if the decided skill to be taught involves navigating public transportation or purchasing items in a store, practitioners should consider utilizing solely MMSI for skill acquisition. Students in urban settings might also face difficulties with public transportation or with proximity to a store (Rooney-Kron & Dymond, 2021).

This leads to another point of consideration, can the desired skill solely be taught in a multimedia simulated setting, with generalization occurring in the community? While not all interventions utilizing solely MMSI incorporate a generalization measure, it is preferred (Kennedy, 2005). Generalization measures will assist students with transferring the multimedia simulated skills to a naturalistic setting, as in-vivo exposure promotes learning and maintenance of the acquired skill (Hetzroni & Banin, 2017). While most MMSI includes generalization measures to strengthen the external validity of the results (Test et al., 2017), in some instances, generalization measures cannot be conducted due to logistical barriers.

Clara attends school in a rural area, therefore, using CBI in conjunction with MMSI would be difficult. Additionally, the proximity to the closest store or public playground is over 45 minutes away, thus causing round-trip transportation to be over 90 minutes. Students in Mrs. Fords' class, Clara included, struggle with behavioral regulation during unstructured times, which was another factor in Mrs. Ford's decision to use MMSI without CBI to teach responding to strangers. Mrs. Ford considered the feasibility of generalization measures due to logistical barriers, and decided that the school playground could serve as a generalization measure location

Step 3: Consider the Multimedia Simulated Components of the Instruction. Step three involves considering the multimedia simulated part of instruction. Careful consideration should be given to this step, as the individual student and issues of mobility, technology, and logistics should be examined (Lang & Sturney, 2021). Practitioners should consider if the instruction will be solely

multimedia simulated or partially multimedia simulated with a real-life teaching component in the classroom. While solely utilizing MMSI can be considered, quick, efficient, and lead to rapid skill acquisition and maintenance (Bell, 2021), practitioners should consider the pros and cons of utilizing MMSI with no other instructional practices (i.e., direct teacher instruction, modeling, peer role-play, etc.). To best conceptualize the MMSI, it is important to understand the developmental level and needs of the students during this step (Test et al., 2017).

Mrs. Ford's class has 15 students and two paraprofessionals. Students in her classroom range in cognitive and physical ability. Instructional time is highly differentiated and most adults are working in small groups or 1:1 with limited time for direct social skills instruction. When considering the constraints of her classroom, Mrs. Ford decided time for in-person direct teacher-led instruction and role play of stranger safety are limited within the busy day. She considered Clara's ability to work independently, mobility skills, and technology skills and decided to create MMSI utilizing solely multimedia simulated instruction designed for Clara to complete independently.

Step 4: Develop the materials needed for MMSI. Once the skill has been decided and the multimedia simulated component has been determined, practitioners can begin to develop the materials needed for MMSI. At step four it is important to prepare materials to closely imitate relevant stimuli and responses in the community. Within this step, practitioners should integrate multi-sensory strategies and embed multimedia aspects, such as videos, audio, photographs, and/or voice recorded descriptions to closely mimic the real-world setting (Lo et al., 2014). When developing materials, it is also important to consider creating materials so they are replicable for future instruction. One key advantage of MMSI is its' reusable and reproduceable component (Gardner & Wolfe, 2013). If peers or additional adults are needed for video simulation, it should be considered at this step and the selection process should begin. If using peers or minors under the age of 17, practitioners must incorporate obtaining informed, written consent from the students primary caregiver. Additionally, the mobility needs of both the students and the devices being utilized for MMSI (laptop, computer, iPad, etc.) should also be considered (Almumen, 2024). When developing materials, practitioners must also consider the adaptations that will be needed for current and potential students and plan accordingly (National Disability Authority [NDA], 2020).

Since Clara is becoming more socially motivated, Mrs. Ford concluded utilizing peers within the MMSI would be beneficial. She decided to recruit four peers from the general education population and four adults to serve as actors portraying strangers. Since in-person instruction would not be provided, Mrs. Ford knew the videos needed adult voice over in conjunction with role-modeling. Mrs. Ford created a script for the videos and a four-step process to responding to strangers, decided the location of the videos, and filmed the videos from a third-person point-of-view. The videos portrayed a stranger approaching a child and asking the child to accompany them to an unknown location. The child and the actor then engaged in a four-step process to respond to the stranger. While the video was taking place, Mrs. Ford's voice was explaining the four steps. She created a total of four videos. Mrs. Ford concluded that the only technology needed for this MMSI was a computer, a cell-phone for recording, and access to headphones. Mrs. Ford also created data-collection probes for progress monitoring.

Step 5: Check if Other Support is Needed. After the materials are developed, practitioners should check what other supports are needed. Is additional technology needed? Are there specific transportation barriers that need to be addressed? If so, how transportation be provided to addresses these barriers? Are there available community settings where instruction and generalization measures can occur, if appropriate? It is during this step where practitioners should also consider additional features of MMSI that do not require technology. For example, how will student data be recorded and by whom? How often will data be collected? To improve fidelity and integrity, more than one person should be collecting data and data should be collected during every session (Kennedy, 2005). How will practitioners respond when students are unsure of a

response during MMSI? Will there be a time-delay in responding to students? Will practitioners provide prompts or immediate feedback? While there is no right or wrong response to these questions, MMSI can be implemented through various modalities (Abadir et al., 2021; Burckley et al., 2014; Carlile et al., 2018; Dixon et al., 2020; Walker at el., 2016). For more guidance with answering these questions, practitioners can reference Kratochwill et al. (2010).

These features of MMSI are important to consider as they are crucial to the reliability, validity, and replication of the study (Lang & Sturmey, 2021). If including a component of CBI, practitioners must also consider the type of systematic instruction that will be utilized in the community setting. Will instruction in the community include a system of least prompts, a time delay, and/or direct and immediate performance feedback? It is important to plan for behavioral concerns at this step as well, as learning a new skill could be frustrating and overwhelming for some students (Hofmann & Müller, 2022).

While Mrs. Ford felt that simply having Clara watch the videos would be beneficial, she knew she needed to keep data for progress towards her IEP goals. Mrs. Ford decided the best way to keep data, was to engage in bi-weekly role-play scenarios with Clara in which she was required to act out the steps of the MMSI videos with an unfamiliar teacher, with Mrs. Ford taking data. Mrs. Ford felt taking data twice a week was sufficient to show progress. As Clara's response time during class is sometimes delayed, Mrs. Ford agreed to wait 20 seconds for Clara to appropriately act out the step in response to the stranger. If after 20 seconds of no response, Mrs. Ford would provide Clara with the appropriate action.

Step 6: If Using CBI, Develop Instructional Strategies. If the intervention is utilizing components of CBI, the sixth step applies and should be when practitioners begin developing instructional strategies for CBI. Practitioners should consider how often instruction in the community-setting will occur. Will it occur daily, bi-weekly, weekly? If it occurs frequently, what implications does that have on the materials needed and transportation? Practitioners should develop materials to utilize in the community setting and should decide which component of the intervention will be taught in the community setting and for how long (Burckley et al., 2014; Carlile et al., 2018; Yakubova & Taber-Doughty, 2013). Once again, logistics, the skills being taught, and student characteristics should be considered here. Careful attention should be given to data collection procedures, with practitioners deciding how frequently data will be gathered in the community. Practitioners should once again pay attention to behavioral concerns and specific concerns associated with learning skills in a community. Understanding the needs of your students is important because community settings are often less structured and more stimulating than the classroom, allowing for more competing behaviors (outbursts, inattention, etc.) to interfere with performance (Adams & Malone, 2021).

This step was not considered, as this MMSI did not utilize CBI. However, had it included CBI, Mrs. Ford's decision making process would have looked similar to Step 4.

Step 7: Create probes across settings. For the seventh and final step, practitioners must develop probes for the community (if applicable) and multimedia simulated settings. An important feature of MMSI is that it measures student performance in the multimedia simulated environment and the community (Almalky, 2018). The goal of MMSI is to teach a skill in a multimedia simulated setting so the student can then demonstrate that skill in the community and transfer it to novel settings. Therefore, data should be taken in both settings (Almalky, 2018). By gathering progress monitoring data, changes in behavior over time can be observed (Kennedy, 2005). Practitioners should consider, if possible, how students will practice multimedia simulated skills in the community. Students should be able to practice skills in a community setting, allowing for natural cues to support them (Trevor et al., 2021). However, if transportation and logistical barriers do not allow for exposure to a community setting, what considerations should be given? Can a multimedia simulated environment be created to replicate community sites? At this step, practitioners should also consider the materials needed in the community or multimedia simulated

setting. Will students need money or an ATM card to demonstrate multimedia simulated skills? Are additional paraprofessionals needed to support students in the community?

For a generalization measure, Mrs. Ford decided the playground would be a hypothetical situation where a stranger could approach a child. Although Mrs. Ford did prefer a more naturalistic setting, when considering location and logistical concerns, the playground was the best option available. Since no additional materials or paraprofessionals were needed, Mrs. Ford only needed to create the generalization probe similar to the progress monitoring probes that occurred in the classroom setting. For this measure, Clara and Mrs. Ford went outside to the school playground. Mrs. Ford then indicated she needed to walk inside to retrieve her water and for Clara to keep playing. Once Mrs. Ford was out of Clara's sight, an individual unfamiliar to Clara approached and asked her to accompany her to an unknown location. Clara was given ten seconds to respond to the stranger with the four-step process. If she did not respond or responded incorrectly, Mrs. Ford immediately came back into Clara's view.

Future Recommendations

The proposed theoretical framework provides a practitioner friendly guideline for creating MMSI within a classroom setting. MMSI is an effective strategy to teach students with disabilities various skills, including purchasing, banking, transportation, safety and social skills which are often a deficit for students with intellectual disability. However, the initial development of MMSI can seem overwhelming and deeply conceptual for teachers who are new to the profession or burned out, adding yet another burden placed on teachers in an ever-demanding profession (Hopkins & Dymond, 2020). This framework can support teachers in the decision making process about the utility of MMSI within their classroom setting.

By following the seven steps to creating MMSI, conceptual design barriers are removed and practitioners can focus on tailoring MMSI to meet the specific and individualized needs of their students. Creating MMSI requires a thoughtful and inclusive approach (Test et al., 2017). Each step of the proposed framework provides carefully crafted decision questions for practitioners to consider for the effective design and implementation of MMSI. While individual strategies and instructional tools are unique to each practitioner, this outline can serve as a guide for understanding the practical considerations of utilizing MMSI with fidelity for students with intellectual disability.

The proposed theoretical framework for developing MMSI for students with intellectual disability should be validated to ensure it accurately reflects the constructs, instructional processes, and learner needs it is intended to support. Because MMSI is often used to teach complex, multi-step skills to learners who may require highly structured, accessible, and individualized supports, it is essential that the framework guiding its design is both conceptually coherent and pedagogically effective (Test et al., 2017). Moreover, validating the framework strengthens its credibility and generalizability, providing practitioners and researchers with confidence that it can be used reliably to inform the development and implementation of MMSI interventions.

Researchers, practitioners, and teachers are encouraged to incorporate this proposed framework into future investigations to further establish its empirical grounding and utility in the development of MMSI for students with intellectual disability. While a limitation of this framework is that it not yet empirically validated, the validation process could be achieved in teacher preparation programs. The proposed theoretical framework can be utilized by teacher preparation programs while students are in practicum or internship placements. The straightforward, step-by-step design would lend nicely to the skillset of newly trained teacher educators and research has already demonstrated MMSI can be helpful in teaching various skills (See Appendix A).

This seven-step, MMSI theoretical framework encourages deep thinking and conceptual understanding, which is important for newly trained teacher educators (Roony-Kron & Dymond, 2021). The framework not only encourages practitioners to think about the unique needs and skills of their students, it also encourages practitioners to consider the pragmatism of teaching the skill through via

solely MMSI or in conjunction with CBI, as not all skills can be taught utilizing solely MMSI. The framework supports educators throughout the entire conceptualization process, beginning with understanding the desired skill to be taught and ending with the creation of probes for multimedia simulated and community settings. Careful consideration is given to the logistical needs for effective implementation, including transportation and staffing needs. The framework also encourages practitioners to think about the community and behavioral needs of each student. If practitioners consider each step, the result is a comprehensive MMSI intervention tailored to the student's unique needs.

MMSI is a cost-effective way to deliver high quality interventions to students with intellectual disability who might be homebound or have mobility issues that limit their participation in the community. MMSI can be delivered at any time and is also favorable for practitioners in rural areas, where travelling into the community is challenging (Dymond, 202). Additionally, research has suggested that video instruction has become more popular with the increased reliance on technology in the classroom (Allcoat et al., 2021). Students with and without disabilities describe MMSI as interactive, captivating, and engaging (Bippert & Harmon, 2017). MMSI provides teaching opportunities and examples for students to learn. These opportunities may not typically be available within the classroom walls and open multiple learning experiences (Westman, 2021). With the proposed theoretical framework to rely on, teachers can confidently create MMSI activities that align with evidence-based practices, promote student engagement, and build complex skills in manageable, scaffolded steps. Ultimately, a framework empowers future teachers to design higher-quality instructional materials, fosters professional decision-making rooted in theory, and equips them to better serve students with varied learning profiles.

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Appendix A

Practical Elements of Multimedia Simulated Instruction (MMSI) from 2011-2024

Reference	Target Skills	Materials	Implementation Procedures	Practical Considerations
Abadir, DeBar, Vladescu, Reeve, & Kupferman (2021)	Abduction prevention skills	iPad air, iPhone, researcher created videos, camera with lanyard (for participants), create social validity measure	1. Create videos with differing lures (4) 2. Determine participant code word 3. Student watches videos 4. Role-play occurs immediately after watching video, with same lure as video provided 5. Generalization across unknown locations, strangers, and lures	>Relatively quick >Includes probe sessions in real-life setting (consider the need for many strangers) >Off-campus locations for generalization so transportation is needed
Akmanoglu & Tekin-Iftar (2011)	Response to lures of strangers	Video demonstrating appropriate lures to strangers, laptop	1. Create video of students responding appropriately to lures 2. Student and teacher watch video together 3. Gradually teach the student appropriate responses and then walk away and have stranger enter and provide the lure 4. Teacher comes back and provides immediate instruction of appropriate response to lure. 5. Gradually fade teacher presence away during lure sessions	> Easy to implement and develop > Internet not needed > Can be used for other serious behaviors >Multiple people/ strangers needed

Almumen (2024)	Electronic journaling	Ipad minis (3), researcher developed video simulations, iPhone to capture videos, notability app for journaling, list of least to most hierarchy prompts, task analysis, data base of scientific essays, articles, science textbook, etc., create fidelity checklist	1. Secure technology and download Notability App 2. Create MMSI videos 3. Train users to use iPad, Notability app, and use task analysis 4. Show videos and have students perform step immediately after video 5. Complete fidelity and task analysis checklist 6. After two weeks- administer maintenance phase	>Long task analysis (32 items) >Time spent gathering samples of essays, websites, and science information >Better suited for higher functioning students with an ID
Bell (2021)	Teaching responses to stranger lures	Computer, video vignettes	1. Create four short video vignettes (each with two versions). 2. Two videos demonstrate correct verbal and motor responses while other videos present lures with no responses (for student to respond to). 3. Have students watch videos. 4. Recruit individuals to act as strangers to lure students	> Camera (can be cell phone) >Videos were short >Acquisition time was fast >Need for individuals as strangers > No need for transportation (no community instruction)
Bramlett, Ayres, Cihak, & Douglas (2011)	Identifying apparel sizes in a store	Multimedia simulated clothing store and environment, computers, researcher-developed video instruction	1. Create video-based instruction probes (vignettes) 2. Create shopping lists for students 3. Have students watch videos locating apparel 4. Practice skills in the classroom simulation while using MMSI.	> Need to create a clothing store in class (and stock with appropriate clothing) > Need a video camera > Consider material cost to create

		for apparel selection and classroom instruction	5. Generalization probes in a local clothing store	classroom simulation > Consider how the selection of clothing sizes will be made and parameters
Burckley, Tincani, & Fisher (2014)	Community shopping skills	iPad, Book Creator Software	1. Develop task analysis 2. Complete a preference assessment for participant to decide items to be purchased 3. Secure agreements for grocery stores and teaching 4. Show student videos inside grocery store 5. Generalization takes place inside novel store without videos	>Need for transportation >No classroom training >Logistics of all training taking place in grocery store >No need to create videos
Carlile, DeBar, Reeve, Reeve, & Meyer (2018)	Asking for help when lost	Video vignettes, real-life materials from community locations (uniforms, shirts, bags), isle items and isle number iPad, iPhone, tangible reinforcement items, Vievu2 camera with lanyard, create social validity probe	1. Decide on locations 2. Secure real-life items from stores (for simulation) 3. Conduct preintervention sessions in real-life setting 4. Show MMSI videos in classroom with simulated setting immediately after 5. Maintenance conducted after two weeks in simulated environment	> The need for generalization locations >Buy-in from local stores and store employees >Photos from store to simulate environment

Dixon, Miyake, Nohelty, Novack, & Granpeesheh (2020)	Pedestrian skills (safely crossing the street)	Oculus Rift, laptop, 360-degree VR videos, camera for recording (with monopod), video-editing device, Stream Client software, researcher developed checklist, researcher developed videos (with distractors and longer videos)	1. Desensitize students to VR device (Oculus) 2. Select appropriate VR clips to show 3. Show VR clips 4. Use flexible prompt fading for responses 5. Implement additional training phases (VR with distractors and VR with long videos)	> Need for an area/location on outside streets >Need for administration at early (sunrise) and late (sunset) times >Expense of an Oculus
Goo, Therrien & Hua (2016)	Grocery purchasing skills	Laptop, digital camera, Adobe photoshop, researcher developed CBVI and checklists, researcher developed computer-based assessment program for data collection	1. Develop computer-based assessment system 2. Create MMSI and checklists for data collection 3. Administer baseline probes at local grocery store 4. Show MMSI videos 5. Conduct generalization probes at grocery store	>Consider impacts of people at grocery store on generalization
Kang & Chang (2020)	ATM use	Let's go banking (game), ATM simulator, augmented reality app, iPad and/or computer, teacher created task-analysis, social validity questionnaire	1. Develop task-analysis 2. Develop social validity questionnaire 3. Teach students how to operate AR videos/phone 4. Administer AR videos 5. At two-week post-intervention phase, administer maintenance probes	> Consider purchasing/price of VR game and ATM simulator >No travel/transportation needed >Videos are already created

Lo, Sher, Hong, Chang, Wu (2024)	Car Washing	VR Vocational Skills Training System, Windows Mixed Reality Headset, Acer AR/VR Remote controller, computer, researcher developed CBVI task analysis, developed social validity questionnaire	1. Create VR Probes or purchase system 2. Develop task analysis 3. Develop social validity scale 4. Divide students into two equal groups, one VR and one traditional instruction 5. Teach VR students how to use computer and remote control, plus preparatory tasks 6. Administer VR or use traditional methods (depending on group) 7. Administer questionnaire	> Consider purchasing VR Vocational Skills Training System >Creation of own VR system >No travel or transportation needed >No generalization measure
Mechling & Seid (2011)	Campus pedestrian skills to specific locations	Researcher-developed self-prompting system with campus photographs, and audio & video recordings, presented on Cyrano Communicator	1. Create campus photographs, audio and video recordings 2. Create self-prompting system 3. Pre-training for student to use self-prompting system for unrelated tasks 4. Provide student with device programmed with self-prompting system and verbal direction of target location	>Time investment to develop the self-prompting system >Internet not needed >Cyrano Communicator used in this study (approximate cost $1300.00); could develop intervention and depict on other handheld electronic device >Locations taught identified prior to preparing self-prompting system

Scott, Collins, Knight, & Kleinert (2013)	Money management	iPod, headphones, researcher developed videos, simulated ATM machine, wallet, researcher developed task analysis	1. Develop a 15-step tasks analysis. 2. Create videos from first person POV 3. Create a fake ATM machine 4. Establish a bank account at a bank for generalization 5. Show MMSI videos 6. Conduct generalization probes at a bank	> Create a bank account > Simulated ATM with labels > Involves use of real money > Creating videos to movie, then pod cast, then iPod > Transportation for generalization to a bank/ATM
Simmons, Miller, Uphold, & Horn (2023)	Responses to stranger lures	Videos (4) demonstrating peers responding to stranger lures	1. Create a list of lures 2. Create 4-step process to responding to stranger lures 3. Create videos of typical peers responding to stranger lures in differing locations 4. Student watches videos 5. Student and teacher role-play four step strategy 6. Generalization probe occurs in naturalistic setting	> Easy to create and implement > Involves peer modeling > Involves a role-play scenario with student and teacher > Consider where generalization probe will take place
Walker, Vasquez, & Weinke (2016)	Teach interview and social skills through role-playing and coaching	TLE Teach LivE, flat screen TV, projection device, webcam	1. Conduct baseline assessment interview in classroom/lab setting 2. Conduct MMSI using TLE Teach LivE environment and individual coaching sessions 3. Complete follow-up interview 14-21 days after mastery is achieved for generalization probes	> Cost of TLE Teach LivE program/software >Multiple baseline across days research design > Hard to distinguish is Teach LivE or individual coaching was contributing factor to growth

Wu & Tsai (2023)	Cooking	Researcher created videos, AR cards, an app for playing created videos, tablet, researcher developed task analysis sheets, cooking materials (measuring cup and rice cooker), researcher made social validity interview	1. Create task analysis 2. Create VR videos for each task (step)Create progress monitoring tool 3. Create social validity questions. 4. Secure materials needed during AR probes (measuring cup, rice, cooker) 5. Administer AR videos 6. Conduct generalization probes when appropriate	> RAVVAR interface platform discontinued in 2022 >Very limited materials needed >No transportation needed >Generalization probe can be conducted in classroom
Yakubova & Taber-Doughty (2013)	Social skill interactions when purchasing items at a grocery store	Computer, researcher developed CBVI videos	1. Develop MMSI for all 6 target social skills 2. Conduct baseline assessment at local grocery store (5-10 sessions) 3. Implement MMSI for 6 sessions 4. Conduct generalization sessions (3) in an unfamiliar grocery store 5. Administer social validity measures (student informal interview and teacher survey using a Likert Scale)	>Element of social validity conducted > Consider concerns of anxiety for students and impact on performance >Consider the use of audio during MMSI