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A Case Study in Increasing Empathy towards Deaf People Using the Role-Playing Game *Sign*

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Abstract

Inclusive education and the development of empathy among educators are crucial for supporting students with disabilities. Deaf individuals, often facing unique challenges in mainstream educational settings, benefit from an educator's increased awareness and empathy. This study explores the impact of the role-playing game *Sign: A Game About Being Understood* (SIGN) on assistant language teachers' (ALTs) levels of empathy towards and awareness of deaf individuals in Japan.

A mixed-method approach involving four ALTs from a rural prefecture in Japan was employed. Qualitative data were collected through pre- and post-intervention surveys with open-ended questions and a debrief-group interview session, while quantitative data were gathered using the Interpersonal Reactivity Index (IRI). The qualitative data were analysed using thematic analysis, focusing on three themes: Increased Empathy for and Awareness of the Deaf; Communication Challenges; and Game Mechanics. Participant responses indicated an increase in empathy and awareness of the deaf experience following the intervention. This study highlights the potential of experiential learning tools in teacher-training programs to foster more inclusive and supportive educational environments.

Keywords: empathy, deaf, role-playing games, assistant language teachers, Japan

要約

インクルーシブ教育および教育者の共感の発達は，障害を持つ学生を支援するために極めて重要である．ろう者は，一般的な教育環境において独自の困難に直面することが多く，教育者の意識と共感が高まることで利益を享受する．本研究は，アシスタント言語教師（ALT）のろう者に対する共感および意識のレベルに与える，ロールプレイングゲーム「Sign: A Game About Being Understood (サイン)」の影響を探求するものである．

日本の地方県に在住する 4 名の ALT を対象とした混合法的アプローチを用いた．質的データは，事前・事後のアンケート調査および自由回答形式の質問，並びにグループ面接を通じて収集された一方で，量的データは「対人反応性指数（Interpersonal Reactivity Index, IRI)」を用いて収集された．質的データは，ろう者への共感と意識の増加，コミュニケーションの課題，およびゲームのメカニクスという 3 つのテーマに焦点を当ててテーマ分析によって分析された．

参加者の回答は，介入後にろう者の体験に対する共感と意識の向上を示した．本研究は，教育者養成プログラムにおける体験的学習ツールの可能性を強調しており，よりインクルーシブで支援的な教育環境を醸成する上での意義が示唆される．

キーワード：共感，ろう者，ロールプレイングゲーム，アシスタント言語教師（ALT)，日本

1. Introduction

In recent years, there has been a growing emphasis on the need for inclusive education and the development of empathy among educators to better support students with disabilities. One group that often faces unique challenges in mainstream educational settings is deaf individuals. Recent trends worldwide have encouraged deaf individuals to eschew deaf schools in favour of mainstream schools. Mainstreaming refers to the practice of placing students with disabilities in the same classrooms as students without disabilities, as opposed to a classroom specifically designed for the special requirements of the students. While this has positive aspects such as giving deaf students access to the best education and potentially decreasing discrimination by exposing hearing students to deaf students (Harvey 2013), there are still several difficulties for deaf students in mainstream schools (Todorov et al. 2021; Mansutti et al. 2023).

Deafness has been described as a hidden disability as it is not immediately visible when viewing a person (Nakamura 2006). In Japan, many students who technically fall under the definition of deaf do not consider themselves deaf, nor do they use, or even know, sign language (Nakamura 2006). With this

in mind, it is difficult for teachers to know when deaf or hard-of-hearing students are present. Japan also employs thousands of assistant language teachers (ALTs) from many different countries, primarily to teach communicative English. These ALTs often have no teacher training; therefore, it is particularly important for them to be aware of the additional needs of deaf or hard-of-hearing students.

Historically, there have been some atrocious examples of discrimination against people with disabilities, including sterilisation and eugenics (Harvey 2013). In the particular case of deaf individuals, a (presumably) well-intentioned idea of oralism (favouring lip-reading over sign language) was detrimental to deaf education for decades. Currently, mainstreaming is popular worldwide, with solid reasoning. However, it is important that we work hard to understand the deaf before making sweeping decisions about how best to help them. A clear example is the use of cochlear implants. Cochlear implants are electronic devices, surgically implanted which create vibrations and allows deaf individuals to "hear." Most hearing people think this to be a wonder cure. The Deaf community, however, has long been staunchly opposed to such operations (Harvey 2013). This will be discussed in more detail later in this study. The key message is that we do not know what we do not know.

The role-playing game *Sign: A Game About Being Understood* (hereafter SIGN, to avoid ambiguity) by Thorny Games (2016) offers an innovative approach to fostering empathy and awareness about the experiences of deaf individuals. The player characters in the game are deaf students in Nicaragua in the 1980s, who work together to develop their own sign language. Participants played the role of these characters during the game.

This study explores the impact of SIGN on the levels of compassion and empathy among ALTs in Japan towards deaf individuals. The situation of deaf individuals in the Japanese education system inspired the research in Japan. Although the game setting is Nicaragua, the focus is, as the game title states, about being understood, and thus it was deemed appropriate for this research in Japan.

The literature review provides necessary background information on deafness, empathy, and the use of role-playing games in developing empathy. The methodology section outlines the research design, data collection methods, and overview of gameplay. Thematic analysis in relation to Increased Empathy for and Awareness of the deaf; Communication Challenges; and Game Mechanics are detailed in the results section. The Discussion section interprets these results before making recommendations for future research.

2. Literature Review

What is deafness? – Levels of hearing are defined by how loud a sound must be for an individual to barely hear it. 20 decibels (dB) is estimated to be someone whispering about five feet away, while 110 dB is equivalent to someone shouting in your ear (Center for Hearing and Communication 2021). The World Health Organization (WHO) describes anyone as having "reduced hearing capacity" if their hearing threshold is above 20 dB in both ears (Sensory Functions, Disability and Rehabilitation (SDR) 2021). The extent of their impairment may classify them as "hard of hearing" or "deaf." In the same report, the WHO claims that 1.5 billion people worldwide experience some decline in their hearing, and at least 430 million will require care.

Japan uses a unified scale to classify disability levels, ranging from Grade 7 (mild disability) to Grade 1 (severe disability). With regard to hearing, Grade 6 is the lowest level (most hearing) which implies a hearing threshold of 70 dB in both ears, whereas Grades 1 and 2 indicate a loss of more than 100 dB in both ears (JSRPD 2024). Approximately 341,000 people were deaf or hard of hearing under this classification in Japan in 2016 (Ohorella and Pambayung 2023).

At this stage, it is important to point out the difference between Deaf and deaf. People who identify with "Deaf culture" and "Deaf politics" and who use sign language as their primary language are usually referred to as "Deaf", whereas lower-case "deaf" is an adjective to describe individuals who are audiologically deaf.

Is deafness a disability? – Most medical professionals define deafness as a disability, as it reaches the threshold for a physical impairment. However, those in the Deaf community often resist this

notion, claiming that they are simply part of a linguistic minority and should be protected as one. As deafness has traditionally been defined as a disability, and most research treats it as such, this study considers deafness as a disability for the purpose of gathering research.

An important development in the medical treatment of deafness is cochlear implants, which bypass the auditory canal and create vibrations in the auditory nerve, allowing the person to artificially hear (NIDCD 2024). The hearing community often sees this as a clear cure for a disability and is usually shocked to hear that the Deaf community largely opposes this development. Deaf individuals in the Deaf community do not consider themselves disabled, and thus do not require a cure. They have launched fierce opposition to the use of cochlear implants, particularly when the decision is made on the behalf of young children, with some even comparing the practice to genocide (Harvey 2013).

Discrimination faced by the deaf – Along with most people with disabilities, deaf individuals have historically faced discrimination and terrible treatment. Humphries (Humphries 1977) coined the term "audism" as the concept of one individual being superior to another based on auditory capabilities. Attempts have been made to eliminate people with disabilities through sterilisation and eugenics (Harvey 2013; Nakamura 2006). Deafness has also been referred to as an invisible disability, as it is not readily apparent when looking at an individual, as many other disabilities are (Mackenzie and Smith 2009).

Deaf education – The first school for the deaf in America was established in 1817, and deaf education grew from there. The 1800s are often called the "Golden Age" of deaf education and sign language (Office of Equity, Diversity, and Global Engagement 2024). However, in 1880, the Milan Congress deemed sign language as a problem, and proclaimed that it should be replaced with "oralism" (Deaf Museums Project 2020). Oralism is the practice of teaching deaf students to lip-read and communicate verbally to the exclusion of sign language.

The negative effects of oralism on deaf individuals have been explored in relatively modern Nicaragua. Prior to the 1980s, there was no established sign language in the country, and deaf individuals were extremely isolated. In the 1980s, the Melania Morales Special Education Center opened to address this issue. Initially, any attempts at sign language were discouraged. However, this approach proved to be unsustainable. By 1986, the Nicaraguan Ministry of Education contacted July Kegl, an American Sign Language linguist from MIT. The staff thought the students' miming was indicative of failed language learning, but Kegl noticed that the students had developed their own unique sign language, independent of Spanish. This led to a shift in the educational approach and the students were encouraged to continue developing their own language. Further details can be found in Polich (2005). The game SIGN is based on these experiences.

An apology for the damaging effect the Milan Conference decision had on deaf individuals and the development of sign languages was made in 2010 (Deaf Museums Project 2020).

The current approach to deaf education in many countries is to mainstream children with disabilities. In other words, they will attend mainstream schools alongside students without disabilities. In America, this is supported by the Individuals with Disabilities Act (IDEA), which argues that this gives people with disabilities access to the best education, and also exposes mainstream students to people with disabilities, hopefully reducing discrimination (Harvey 2013). However, not learning sign language and potentially having comprehension and communication problems in mainstream schooling remains a concern (Todorov et al. 2021; Mansutti et al. 2023).

Mainstreaming has become standard practice in Japan. Nakamura (2006) argues that parents in Japan choose to mainstream their children with good intentions, as conformity is an important cultural aspect of Japan. Nakamura further argues that it is often the choice of the students, not the parents, whether to attend dedicated schools for the deaf, or mainstream schools. Many deaf students in mainstream schools do not know any sign language and are often unaware of deaf associations in Japan. Such students often do not consider themselves deaf, but rather hard of hearing (Nakamura 2006).

As students are in mainstream education, and deafness is often an invisible disability, particularly when students do not know or use sign language, it is crucial that educators attempt to understand their situation and be mindful of extra accommodations while teaching.

Empathy vs Sympathy – The terms empathy and sympathy have been used interchangeably and contradictorily in the past (Jerrett, Howell, and Dansey 2021; Maibom 2017);. The two concepts are certainly similar, however, empathy plays a key role in understanding the life another person lives, whereas sympathy more often leads to pity (Gerdes 2011). It has been stated many times that empathy is the key to understanding and helping people with disabilities (Gerdes 2011; Sanja, Stanko, and Jasna 2022) . Social blogs of people with disabilities have routinely expressed that empathy is what they want, not sympathy (Khanna 2019; Singh 2022).

Games have been used in a plethora of contexts to achieve a variety of goals. These range from improving communication among language learners (Reinders and Wattana 2012) and increasing engagement in STEM subjects (Bertozzi 2014) to tackling climate change (Gao, Guo, and Jiang 2021) and international conflict resolution (Nilsen et al. 2011). Role-playing games and simulations, in general, have been found to increase empathy among participants. Simulations have been widely used in medical training to improve medical professionals' empathy (Bagacean et al. 2020; Zhao et al. 2023). Role-playing, in particular, encourages participants to take other viewpoints and develop their levels of empathy (Carnicero Pérez, Moreno-Rodríguez, and Felgueras Custodio 2023; Jerrett, Howell, and Dansey 2021).

However, role-playing is not a perfect solution for developing empathy towards people with disabilities. The experience and insight gained by players can produce a false impression of what it is truly like to be such individuals (Cazeneuve 2022). Many studies have shown that simulations can cause participants to pity those with disabilities and to be more fearful of becoming disabled (Miller 2013; Arielle Michal Silverman 2015; Arielle M. Silverman et al. 2018; Nario-Redmond, Gospodinov, and Cobb 2017; Riccobono 2017). Several recommendations have been proposed to avoid this unintended negative outcome. Behler (1993) suggests maximizing the authenticity of the experience, while Silverman recommends learning the skills that disabled people use to overcome the difficulties they face (Arielle Michal Silverman 2015; Arielle M. Silverman et al. 2018). The argument is that the immediate imposition of a disability with no guidance on how to use it is unlikely to provide a realistic view of how people live with disabilities. It is also argued that high levels of involvement and interaction with people with the targeted disability will lead to more authentic and less pity-inducing experiences (Arielle Michal Silverman 2015; Riccobono 2017).

The SIGN game designers (Thorny Games) worked closely with the original sign language linguistic in Nicaragua, Judy Kegl, along with the Nicaraguan Sign Language Projects (NSLP) while designing this game. This included site visits and interviews (details of which are available on their website (www.thornygames.com/sign). In addition, feedback from deaf play-testers is included in the debriefing session, which is to be read to all participants after the gameplay. Further, all proceed from SIGN go to the NSLP to support sign language in Nicaragua.

Empathy for the Deaf – Sign language is one of the primary communication methods used by deaf people. Therefore, when trying to understand deaf people, learning sign language is a logical starting point. The innovative role-playing game Inspirisles (Oxenham and Oxenham 2019) and its sequel Overisles (Oxenham and Oxenham 2023), have integrated sign language into the mechanics of the game, with physical and digital tools to teach both American Sign Language (ASL) and British Sign Language (BSL). A recent study (Cullinan and Wood 2024) found that middle school students learned 50-100 ASL signs over 45 days.

However, learning sign languages may be a significant hurdle for many people. In addition, like spoken languages, no single sign language is used everywhere. Furthermore, sign languages often differ greatly from the spoken language within a country or region. For example, ASL is based on French sign language, as opposed to spoken English, which is a Germanic spoken language, and ASL and BSL are completely different languages. Nakamura (2006) also describes how different, and sometimes mutually unintelligible sign language can be within a single country, with Tochigi Prefecture in Japan utilizing unique grammar in their sign language. To reach a wider audience and remove barriers of translation and localisation, a less intensive, more general approach may be required.

English is an important subject in Japanese schools. However, the nature of the education system focuses on grammar-translation teaching (Butler 2015). The role of communicative English is often left

to instructors whose native language is English (Jones 2019). In public schools, this is primarily through the Japan Exchange and Teaching Program (JET), through the use of Assistant Language Teachers (ALTs), which employs 5831 participants from 50 countries as of 2023 ('History', n.d.). As ALTs are largely responsible for the communicative English education of students, some of whom may be deaf or hard of hearing, raising awareness among ALTs of the communicative needs of such students is important.

3. Methodology

This study employed a mixed-methods approach to investigate the impact of the role-playing game "Sign" (SIGN) on the levels of compassion and empathy among assistant language teachers in Japan.

This study involved four current and former assistant language teachers (ALTs) who responded to an open call made to a population of 130 current and former ALTs residing in a rural prefecture in Japan. Ultimately, four ALTs volunteered to participate, reflecting the challenges associated with recruiting participants for a study involving role-playing games. Owing to the small population size, all participants were, to some extent, known to the researcher and to each other.

The participants ranged in age from 25 to 44 years, comprising three females and one male. Their teaching experience in Japan varied from 2 to 10 years. At the time of the research, one participant was teaching at a public university, one at a public senior high school, and two at public junior high schools. Three participants were American, and one was from Trinidad and Tobago. All of the participants reported having no direct interaction with deaf individuals prior to the research.

Data were collected using both qualitative and quantitative methods, with the primary emphasis on qualitative data. The qualitative data collection involved pre- and post-intervention surveys with open-ended questions and a group debriefing session after playing the game that was recorded and transcribed. These methods were chosen to allow participants to reflect thoughtfully on their experiences, while also capturing their immediate reactions following the game.

Quantitative data were collected through pre- and post-intervention surveys designed to measure changes in participants' levels of empathy. Several scales were considered to measure this aspect. The Toronto Empathy Scale (Spreng et al. 2009) and the Empathy Quotient (Baron-Cohen and Wheelwright 2004) only produce a single numerical result, thus not allowing for much nuance in evaluation. The Basic Empathy Scale (Cabedo-Peris et al. 2021) is primarily targeted towards children, and the Jefferson Scale of Physician Empathy (Hojat et al. 2018) is intended for medical professionals. The Interpersonal Reactivity Index (IRI) (Davis 1980) is a scale for general use, and provides four categories of empathy to be measured. This scale has been found to be a particularly valid and reliable method of self-assessed empathy (Neumann et al. 2011). Thus, the IRI was selected for use in this study.

The IRI consists of 28 items on a 5-point Likert scale. The respondents assess how well each item describes them, ranging from "A – Does not describe me well" to "E – Describes me very well." Each item is associated with one of four categories of empathy, and there are seven items for each category. The scores are gathered and analysed, with a numeric score attached to each response. A score of 0 is given for an answer of "A" and a score of 4 is given for an answer of "E." Several questions have reversed scores, meaning "A" would give a score of 4, and "E" would give a score of 0.

The four categories are as follows (taken directly from Davis 1983, 113–114):

- Perspective Taking (PT) – assesses the tendency to spontaneously adopt the psychological point of view of others
- Fantasy (FS) – taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays
- Empathic Concern (EC) – assesses "other-oriented" feelings of sympathy and concern for unfortunate others
- Personal Distress (PD) – measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings

The IRI is a widely used instrument to assess empathy. However, given the small sample size, the quantitative findings were only used to support qualitative data.

The data collection process began with the administration of pre-intervention surveys that included both IRI and open-ended questions aimed at gauging participants' initial perceptions of deafness and empathy levels. This survey was completed two weeks prior to the intervention. The intervention took the form of a two-hour session of the game SIGN. Immediately following the game of SIGN, participants took part in a semi-structured group discussion, using questions provided in the "Debrief" section of the game book, and additional questions posed by the researcher. This discussion took approximately one hour and was recorded and transcribed. Two weeks after the game session, participants completed post-intervention surveys.

While perfect anonymity was difficult, as participants were all known to each other and the researcher, every attempt was made to anonymise the answers. All participants were given a random 5-digit identification code with which to fill out the surveys. After the transcription of the debriefing sessions, a find-and-replace function was run to replace all names with each participant's identification code. This was performed prior to data analysis.

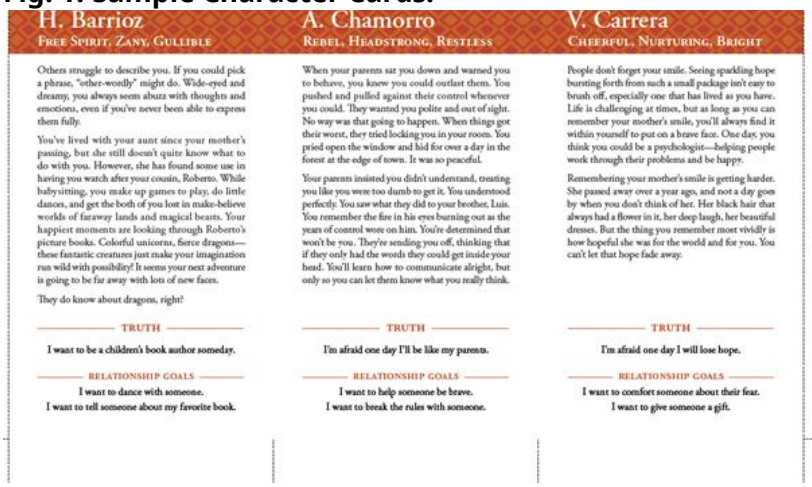
Qualitative data were analysed using thematic analysis. The answers to the pre- and post-intervention surveys, as well as the group interviews, were coded systematically. Three main themes emerged from this analysis: Increased Empathy for and Awareness of the deaf, communication challenges, and gaming mechanics.

4. Gameplay

In SIGN, players are given two character cards (see Figure 1) with information about a Nicaraguan student, including their background, descriptive adjectives, and their "truth" – something important to the character. Each player chooses one of the two characters and assumes the role of that character for the duration of the game.

During the game, players are encouraged to mark their hands with a cross (see Figure 2) anytime they make a "compromise" – any time they feel they have not understood the meaning of others, or any time they feel they have not been understood. During this study, the crosses were replaced with handheld clicker counters provided to each participant. The benefit of the clicker counter is that it can be used instantly without looking, whereas a marker requires opening and closing, and most likely looking down at one's hands. In a game about deaf experiences, it was decided that breaking eye contact could remove the participants from conversations. Although markers give more freedom to the size of the cross,

Fig. 1: Sample Character Cards.



H. Barrioz
FREE SPIRIT, ZANY, GULLIBLE

Others struggle to describe you. If you could pick a phrase, "other-wordly" might do. Wide-eyed and dreamy, you always seem abuzz with thoughts and emotions, even if you've never been able to express them fully.

You've lived with your aunt since your mother's passing, but she still doesn't quite know what to do with you. However, she has found some use in having you watch after your cousin, Roberto. While babysitting, you make up games to play, do little dances, and get the both of you lost in make-believe worlds of faraway lands and magical beasts. Your happiest moments are looking through Roberto's picture books. Colorful unicorns, fierce dragons—these fantastic creatures just make your imagination run wild with possibility! It seems your next adventure is going to be far away with lots of new faces.

They do know about dragons, right?

TRUTH

I want to be a children's book author someday.

RELATIONSHIP GOALS

I want to dance with someone.
I want to tell someone about my favorite book.

A. Chamorro
REBEL, HEADSTRONG, RESTLESS

When your parents sat you down and warned you to behave, you knew you could outlast them. You pushed and pulled against their control whenever you could. They wanted you polite and out of sight. No way was that going to happen. When things got their worst, they tried locking you in your room. You pried open the window and hid for over a day in the forest at the edge of town. It was so peaceful.

Your parents insisted you didn't understand, treating you like you were too dumb to get it. You understood perfectly. You saw what they did to your brother, Luis. You remember the fire in his eyes burning out as the years of control wore on him. You're determined that won't be you. They're sending you off, thinking that if they only had the words they could get inside your head. You'll learn how to communicate alright, but only so you can let them know what you really think.

TRUTH

I'm afraid one day I'll be like my parents.

RELATIONSHIP GOALS

I want to help someone be brave.
I want to break the rules with someone.

V. Carrera
CHEERFUL, NURTURING, BRIGHT

People don't forget your smile. Seeing sparkling hope bursting forth from such a small package isn't easy to brush off, especially one that has lived as you have. Life is challenging at times, but as long as you can remember your mother's smile, you'll always find it within yourself to put on a brave face. One day, you think you could be a psychologist—helping people work through their problems and be happy.

Remembering your mother's smile is getting harder. She passed away over a year ago, and not a day goes by when you don't think of her. Her black hair that always had a flower in it, her deep laugh, her beautiful dresses. But the thing you remember most vividly is how hopeful she was for the world and for you. You can't let that hope fade away.

TRUTH

I'm afraid one day I will lose hope.

RELATIONSHIP GOALS

I want to comfort someone about their fear.
I want to give someone a gift.

indicating how great the compromise was, it was decided that allowing participants to stay in the conversation and the flow of the game was more important.

After a brief read-aloud section from the game booklet, and a few quick warm-up activities, there is no further spoken communication until the end of the game. The researcher acted as the teacher of the class. The game alternates between classroom and recess scenes. At the start of every scene, each participant is given written instructions guiding them through the upcoming scene.

Fig. 2: Crosses on hands marking compromises.

In the first classroom scene, each student defines the sign for their name. Student A shows their sign, which is then repeated, one by one, by each other student. Student B then signs their own name, which is repeated by all other students, and so on. After this, the first recess takes place. The students are ushered out into the recess area and are free to do whatever they like. After a set amount of time, the teacher ushers them back in for the second class. During the second class, each student chooses a word from a predefined list (see Figure 3). Each student will create a new sign for that word, which will be repeated by the other students. After this, with a few more vocabulary items defined, the students proceed to second recess, like before.

The third class is similar to the second, but students are free to choose any word they wish to make a sign for, not merely from a predefined list. Students are given blank cards to write their word on, after which they show their new sign for that word, which is then repeated by the other students. In the final recess, students are reminded that this is the last opportunity to share their truth, and that they should try to express it to at least one other student. In the final classroom scene, each student takes a turn "in the spotlight." The other students, one by one, will sign what they think of that student, and how that student made them feel.

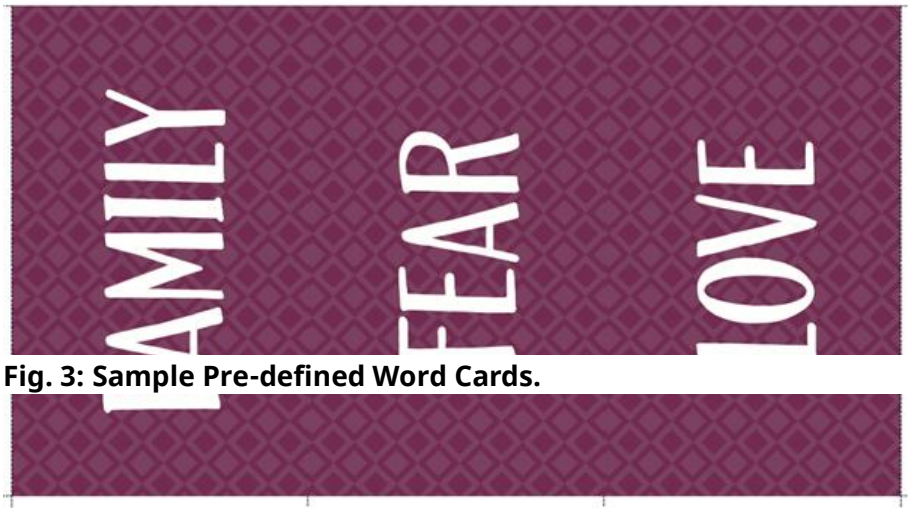


Fig. 3: Sample Pre-defined Word Cards.

This marks the end of the game, but a read-aloud closing statement and a spoken debriefing session are included to help transition out of play and reflect on the experiences of the participants. Debrief questions can be found in the game book and additional questions were asked based on the observations of the researcher, acting as the

teacher during the game. The post-intervention survey included additional questions, which allowed for delayed reactions.

This game is about raising awareness of non-verbal communication and a brief glimpse into a specific example of the deaf experience. This game can be played with or without deaf participants. As the game has no audible components (with the exception of initial explanation and post-game debriefing), there are no restrictions on deaf individuals participating. Indeed, as explained above (page X), involving deaf individuals is likely to give a more authentic experience.

5. Results

The qualitative data focused on three themes: 1 - Increased Empathy for and Awareness of the Deaf; 2 - Communication Challenges; and 3 - Game Mechanics. These themes are detailed below, supported by select quotations from participants and quantitative data, where appropriate.

6. Theme 1: Increased Empathy for and Awareness of the Deaf

Participants expressed a deeper understanding of the deaf experience by playing this game. This theme was explored through three subthemes: acknowledging frustrations that may come with deafness, understanding the importance of visual cues, and changes in levels of empathy.

Subtheme 1.1: Considering the Frustrations that May Come with Deafness – Participants frequently mentioned frustrations experienced the game, which helped them gain insight into the daily struggles faced by deaf individuals. One participant reflected on the mixed emotions elicited by the game, stating: "It was fun at the points we didn't understand each other…Like of course it's frustrating and so if this was our real life it would probably be way more frustrating and tiring."

Another participant highlighted both the initial frustration, but also the satisfaction when communication was successful: "There was a lot of stress there of course, but I think it was also because of that stress, the enjoyment of being able to express what I mean to others, and having other people understand me as well… It felt good I could tell what I wanted."

Subtheme 1.2: Understanding the Importance of Visual Cues – The game emphasises the critical role of visual cues in the communication of deaf individuals. Participants discussed how missing visual information could lead to misunderstandings. Participant 2 described a difficult situation:

> There was a point in the last round where you were like kinda gesturing and explaining… I'm reading the card and I look up and I realize, you've explained everything and I didn't – I missed it… and so that made me like 'oh yeah, I really have to pay attention all the time.' Multitasking must be next to impossible.

Participant 4 explained the extra effort they felt necessary to make during the game: "I felt more aware of making eye contact when talking to them, making sure they can see my face."

During a recess period, one participant playfully pulled a hood over the face of Participant 3. Upon reflection, Participant 3 mused: "That was essentially cutting my line of communication away." This prompted other participants to discuss the difficulties likely faced by deaf individuals during the COVID-19 pandemic: "I was thinking of, with eye contact, I know during the COVID pandemic, a problem for a lot of people is that everyone was wearing masks… It's like you have to be very aware to look them in the eyes."

Subtheme 1.3: Increased Empathy – In the pre-intervention survey, all participants self-assessed themselves as having high levels of empathy towards deaf individuals despite having no direct interactions with them. Pre-intervention IRI results revealed relatively high levels of empathy, as shown in Table 1.

Table 1 — Pre-Intervention IRI Results.

	Participant 1	Participant 2	Participant 3	Participant 4
PT	19	24	21	9

FS	16	27	28	28
EC	22	25	23	24
PD	13	8	19	18

After the game, participants noted that they felt this level of empathy had increased: "While I have been empathetic towards the deaf community, experiencing it firsthand, even in this small way, has made me feel a fraction of their daily struggles"; "My level of empathy was already high, but it has only increased with this experience."

As discussed previously, disability simulations have the risk of creating pity rather than empathy. However, the tools provided seem to have promoted a more capable and positive view of the experience: "The wonderful feeling when I did feel understood or understood someone else. I felt very seen as the person I was portraying."

Similarly, Participants 1 and 3 expressed more positive and less fearful impressions of deaf individuals: "I perhaps feel more willing to engage now and have less 'fear' about trying to bridge communication,"; "I feel more empathetic of problems, but also the feeling like it's not really a problem, just another way to live. Like it shouldn't really be viewed as a 'disability'." Participant 4 also expressed a more empathetic approach they will take to future interactions: "I think I will approach interactions with the deaf community with more focus. I want people to know I hear them (look at them and pay attention to my surroundings)."

The post-intervention IRI results show a more mixed result in relation to empathy development. The post-intervention IRI results are shown in Table 2 below, with the changes highlighted in Table 3.

Table 2 — Post-Intervention IRI Results.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**
PT	20	26	17	10
FS	14	27	28	21
EC	19	27	28	19
PD	10	5	13	16

Table 3 — Changes in IRI results.

	Participant 1	**Participant 2**	**Participant 3**	**Participant 4**
PT	+1	+2	-4	+1
FS	-2	0	0	-7
EC	-3	+2	+5	-5
PD	-3	-3	-6	-2

All participants reported lower levels of personal distress (PD), indicating that they would likely be more comfortable in situations where others are in trouble. Empathic Concern (EC) increased for both participants 2 and 3, but decreased for Participants 1 and 4, indicating very different experiences. FS is discussed in Theme 3: Game Mechanics.

7. Theme 2: Communication Challenges

The game highlighted numerous communication challenges faced by deaf individuals, particularly in expressing complex ideas and emotions. One participant reflected on the difficulty of expressing concepts like time and causality: "I was thinking, how would you express something was or will be." This

was echoed by Participant 4: "Something I had a difficult time with was expressing complex things in the past."

Another participant found seemingly simple concepts surprisingly challenging: "One of the hard things that I was surprised by was 'what' because I think we would all go between 'what' and 'why'... I thought that would be easy."

Another aspect that became apparent was not only struggling to make oneself understood, but also knowing when you were understood. Several misunderstandings arose during the debriefing session:

> My truth was, maybe, I hope you guys understood it, basically my twin sister, she can hear, she's made many friends, so I'm afraid she likes her new friends more than me, so she doesn't like me – she doesn't need me anymore - (P1).
> I missed that, but I got the feeling that you were sad about something with your twin - (P2).
> My truth was I want everyone in school to like me, which was very easy to do and they all got it - (P3).
> I actually misunderstood - (P2).

Different parts of the game seemed to produce different levels of difficulty. "I think it was actually much easier at the beginning than I expected... but then telling the descriptive stuff at the end, that was definitely, I expected that level of difficulty." Participant 1 went on to elaborate on the final classroom scene, where participants describe how other "students" made them feel: "I think I understood about 20% or less of those descriptions, like the general feeling comes through... but in the end, I don't think explaining specifics like that was very easy at all."

8. Theme 3: Game Mechanics

The unique mechanics of this game played an important role in shaping the participants' experiences. A significant challenge was role-playing the adjectives on the character cards.

> It was a bit difficult because this character's adjectives were leader, confident, sly... It was really hard to be this level of confident, leader, and sly. I don't know how to do that.
> My character was quirky, thorny... I don't know how to be quirky.
> I found it hard to role-play in this situation.

Some or all of these difficulties may be due to the nature of focusing on a new method of non-verbal communication. However, the level of experience of role-playing among the participants may have played a role. During the pre-intervention survey, participants reported their level of experience with computer role-playing games (CRPG), tabletop role-playing games (TRPG), and live-action role-playing games (larp). Participants reported on a scale of 1 to 10 with a response of 1 indicating "I have never played," and a response of 10 indicating "I play weekly or more often." The results can be seen in Table 4.

Table 4 — Participants' experience with various kinds of role-playing.

	Participant 1	Participant 2	Participant 3	Participant 4
CRPG	7	9	2	2
TTRPG	2	5	1	4
LARP	1	2	2	1

In addition, there was no change in the Fantasy (FS) score for participants 2 and 3 (see Table 3 above). However, there was a small decrease in FS for Participant 1 and a significant decrease for Participant 4. This may indicate that the inability to role-play complicated characteristics while simultaneously exploring a new method of communication affects the tendency to imagine the feelings

of fictional characters. It should be noted, however, that Participants 2 and 3 were already at or close to the maximum FS score of 28.

Despite these challenges, the overall response to game mechanics has been positive. The participants appreciated the immersive nature of the game and believed that it allowed them to become more empathetic.

> I think it is an appropriate way to share empathy with their situation.
> I felt that the experience was a good glimpse into that way of life.
> I feel like it was a really, really good chance to put ourselves in their shoes. It felt very real.

9. Discussion

This study aimed to explore the impact of SIGN on levels of compassion and empathy towards deaf individuals among ALTs in Japan. The results indicate that awareness levels and self-reported empathy increased. The challenges of nonverbal communication were also highlighted, as well as the positive and negative aspects of game mechanics.

Increased empathy for and awareness of the deaf – The findings revealed that participants felt increased levels of empathy for deaf individuals after playing the game. Additional comments by participants showed that they became aware of new aspects of nonverbal interaction that they had not previously considered. Of particular importance was the realisation of how necessary eye contact and facial expressions can be. Through their own natural experiences, participants realised that, when it comes to non-verbal communication, it is very difficult to 'pause'. It is hoped that participants take this lesson with them and integrate it into their future teaching practices, being mindful of the possibility of 'hidden' deaf or hard-of-hearing students being present in their classes. Some participants explicitly noted that they would be increasingly aware of eye contact and facial expressions moving forward.

One of the most crucial aspects of this study was to investigate the possible negative side effects of this disability simulation. As discussed previously, disability simulations, though well-intentioned, can create negative views of the target disability. While playing this game did highlight the potential communicative frustrations of being unable to express oneself verbally, all participants reported positive feelings from the playthrough. Participants mentioned having less fear when interacting with deaf individuals in the future and approaching such interactions with more focus. In particular, one participant proposed that deafness should not be considered a disability but rather a different way of living. This connects closely with the Deaf community's perspective and contrasts with the technical medical definition.

Communication challenges – This study also highlights the specific communication challenges presented in the game. While the participants were able to communicate more as the game progressed, several pitfalls became apparent. Seemingly simple differences between 'what' and 'why' became stumbling blocks, while more complex ideas, such as past and future tenses, could not be expressed clearly. All the participants reported that the final stage of the game was the most difficult. In this stage, all students have to sign what they think of each other and how the other participants made them feel during the game.

This aspect of the game may be useful in grounding the participants in how far they still have to go to be competent in nonverbal communication. However, this may also prove to be overly frustrating. In this case, it does not seem to have affected the participants' feelings of achievement during the game, but it may be useful to exclude this part in future games, particularly with participants inexperienced in role-playing.

Game mechanics – One significant difficulty reported while playing this game was the ability, or inability, to act out the characteristics of each character. Adjectives such as thorny and sly may be easier for hearing participants to act out in verbal role-playing, but it proved a serious hurdle in this case.

These characters are based on the original students in the Nicaraguan school, so verisimilitude is an important aspect. However, if the participants are unable to embody these characteristics in the game, adjustments may have to be made. Some suggestions include providing participants with character cards

in advance so that they are able to consider the characteristics more deeply. Another idea may be to focus on just one or two of the traits that are easier to role-play. Finally, if necessary, participants may choose their own characteristics based on the character's background.

Overall, despite role-playing difficulties, game mechanics were seen as effective in creating an environment that facilitated a deeper understanding of deaf individuals.

Implications for practice – The findings of this study have several practical implications, particularly in the context of language teaching and teacher training. First, incorporating experiential learning tools, such as SIGN, into teacher training programs can enhance empathy and awareness among educators, leading to more inclusive and supportive learning environments. By understanding the challenges faced by deaf individuals, teachers can develop more effective communication strategies and foster a more inclusive classroom culture. This will only have greater importance, as deaf students continue to attend mainstream schools.

Second, this study underscores the importance of incorporating discussions and reflections into experiential learning activities. Facilitated debrief sessions, such as those used in this study, can help participants to process their experiences. Crookall (2010, 911) argues that "learning comes from the debriefing, not the game," while Nicholson (2012) claims that, despite its well-documented importance, educational games often omit debriefing.

10. Limitations and Further Research

This pilot study, exploring the impact of the game SIGN on the empathy levels of ALTs, has presented some notable findings. However, there are also some significant limitations that should be acknowledged.

First, the number of participants was small, with only 4 participants. This game is designed for between 4-7 people, including the teacher. To clarify, this study had five participants, but the researcher acting as the teacher was excluded from the data. To obtain more robust results, several independent groups should be examined to confirm whether the results hold in a more general setting.

Second, the participants were all familiar with each other and with the researcher. This was an unfortunate reality because of the rural setting and close-knit community of foreign residents in this prefecture. In addition, there was limited enthusiasm for the live-action role-playing game, which significantly limited the potential population.

None of the participants had any prior experience with the Deaf community. Prior experience may affect the results of the game, either positively or negatively. It is worth noting that knowledge of any sign language prior to the game may hinder that player, as any form of established sign language should not be used during the game.

To produce a disability simulation that has a positive effect, the key advice has been to involve disabled advisors in the development, to provide methods to overcome difficulties presented, and to include interaction with disabled individuals during the simulation. While SIGN has provided for the first two aspects of this, the current study did not involve any deaf individuals. However, this pilot study has provided strong support that SIGN does not create negative or pitiful feelings towards the deaf. Therefore, the path for future research is clearly laid out for a larger number of groups, and for more diverse participants, particularly those unknown to each other.

11. Conclusion and Recommendations

This study sought to investigate the effect of SIGN on the levels of empathy that ALTs felt towards deaf individuals. Deafness has been labelled an invisible disability, and as an increasing number of deaf students are placed in mainstream schools or choose to go there, it is becoming increasingly crucial that people understand the communicative needs of deaf students. This importance is even more essential in Japan, where many students do not consider themselves deaf, and do not use sign language. As a result, deaf students in Japan may be more hidden than in other countries practicing mainstreaming. Practising deaf-inclusive teaching, regardless of the perceived presence or absence of deaf students, increases the everyday accessibility of deaf individuals.

As the focus of English in Japanese schools is heavily on exam preparation and grammar translation, the responsibility for communicative English is primarily that of assistant language teachers. If deaf students are to be mainstreamed, they should receive the same education as others. Small changes in teaching methods, including more eye contact and facial recognition, may help deaf or hard-of-hearing students to fully benefit from the education system.

This study found that all participants reported increased levels of empathy for deaf individuals after playing SIGN. Although communicative challenges were present, there appeared to be no increase in fear or pity, with participants expressing more hopeful outlooks towards future interactions with deaf individuals. Certain gameplay mechanics, however, appeared to cause some difficulty for the participants, particularly initially. These aspects should be reviewed prior to play to determine whether they are necessary or expendable for each group.

Overall, positive results were obtained in this study. Given the relatively short time frame (2 hours of play, 1 hour debriefing), it is a game that is easy to apply, and appears to have positive effects on awareness of and empathy for deaf individuals. It is hoped that this study will bring more attention to an innovative game in SIGN and that by playing through this experience, more people will understand the challenges and needs of deaf individuals.

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