

The Impact of Online Tools in Teaching Sign Language to Undergraduate University Students in Bamenda

Enow Parris Cecilia Bechem

*Department of Linguistics and African Languages
Faculty of Arts, The University of Bamenda*

doi: <https://doi.org/10.37745/bjmas.2022.0451>

Published March 22, 2024

Citation: Bechem E.P.C (2024) The Impact of Online Tools in Teaching Sign Language to Undergraduate University Students in Bamenda, *British Journal of Multidisciplinary and Advanced Studies: English Lang., Teaching, Literature, Linguistics & Communication*, 5(2),46-62

ABSTRACT: *The teaching and learning of sign language is a daunting task to 25 first year university students. They face problems remembering vocabulary, memorising signs, applying grammatical and syntactic rules, developing fluency and utilising non-manual markers. A sequential mixed method approach was employed in conducting the research. Descriptive statistics (SPSS version 17) was used to analyze quantitative data, and Huberman (2004) three analytical stages of data reduction process for qualitative data. Findings reveal that of the 25 students, 7 (28%) had difficulties with vocabulary acquisition, 5(20%) grammar and syntax, 8(32%) fluency issues and 5(20%) spatial difficulties. 3(33%) teaching techniques and downloaded digital resources were mostly exploited: www.startasl.com., Signschool App and ASL dictionary for better comprehension. Observations and questionnaires reveal that 20(80%) students who owned cell phones and practiced out of the classroom had positive outcomes whereas 5(20%) had negative impact. The above results are in line with learning expectations suggested by Vygotsky's Socio-cognitive theory.*

KEYWORDS: sign language, teaching, digital technology, motivation, engagement, skill development.

INTRODUCTION

Sign language teaching is a research area that calls for attention because very few studies have been carried out in Cameroon. This study explores the dynamism of the techniques and resources employed in teaching sign language to undergraduates who are beginners in learning this new language. In the University of Bamenda - Cameroon, students are enrolled in a sign language linguistics semester course (14 weeks) which hold once a week (3hours). The course aims at introducing students to a new language (sign language and deaf culture), train and develop

students' signing skills while exposing them to new teaching techniques and sign language online resources. Students do not respond adequately due to time constraint, inadequate textbooks and online digital resources. The teacher is obliged to introduce new teaching options and perspectives integrating extended online learning tasks out of the classroom through home assignments to be completed on their own. Integrating Information Communication Technology (ICT) tools during lessons have side benefits, hence the need for android cell phones and laptops to support learning. These tools play a vital role in the teaching and learning process. Students used their phones regularly watching sign language video tutorials. Implementing online activities is necessary to ameliorate the teaching operatory capacity. Materials for home practice are bought online and downloaded by the teacher from Websites, Mobile Apps and ASL Dictionaries. These materials were shared only to students who had phones and laptops. Familiarity in using these resources results in a method of teaching which eased faster and more comprehensive learning. Students are exposed to a host of ancillary platforms which expedite sign language learning.

Online practice exercises improved the learning curve for beginners. The term technology is broadly understood to include innovative application of methods, tools, materials, devices, systems and strategies which are relevant to the art. The use of online digital resources has several advantages:

1. Students are exposed to topics taught in class through multiple perspectives with varying emphases. The exercises chosen for home practice are selected based on the appropriate areas where students are facing challenges.
2. The reiterative nature of online exercises facilitates repeated contact with the learning contents.
3. Students who are open to online materials improve on their signing skills. They provide immediate feedback; learn without space and time boundaries. Hence, more control is gained of their own learning. They can easily identify problem areas and develop effective learning practices. The study was undertaken to highlight students' difficulties and introduce them to a range of digital resources with the following objectives:

Objectives of the study

The study sought:

- To identify common areas where students face challenges during sign language instruction.
- To explore and integrate different teaching techniques and online resources that engages and enhances their signing skills.
- To assess students progress and learning outcomes.

These objectives led to the following research questions.

Research questions

A comprehensive investigation of the problems in a bid to find logical solutions rest on the questions below:

RQ1: What are the common problem areas where students face challenges mastering and remembering signs during instruction?

RQ2: Which strategies and digital online resources are employed as side benefit to enhance learning?

RQ3: What is the impact of integrating online resources in students' learning?

LITERATURE REVIEW

Review of related literature examined the conceptual, theoretical and empirical framework. The conceptual frame examined concepts related to the topic. The theoretical frame dwelt on Vygotsky's Socio-cultural Theory. The empirical frame looked into previous research studies on similar topics.

Conceptual Framework

The conceptual frame examined concepts that are related to the topic such as: Students motivation and engagement in the teaching and learning process, sign language and digital resources.

Students motivation and engagement in the teaching and learning process

Motivation plays a crucial role in sign language instruction as it directly impacts the learning process and outcomes. Block et al. (2013), posits that the beginning stage of learning is guided by extrinsic motivation. Teachers must understand the unique factors that motivate students to learn. One important aspect of motivation in sign language instruction is the recognition of individual needs and goals of learners. Students have different reasons for wanting to learn sign language, such as personal interest, career advancement, or communication with family and friends therefore, teaching be tailored to meet their specific needs.

To ensure active participation and motivation, various strategies be employed to enhance engagement by incorporating activities that require active use of sign language such as role play scenarios and group exercises and discussions which significantly increases engagement. These activities not only provide opportunities to practice their skills but also encourage collaboration and peer to peer learning.

Setting clear and achievable goals can greatly enhance motivation in sign language instruction. Breaking down the learning process into smaller manageable steps help students track their progress and experience a sense of accomplishment. Teachers should acknowledge students progress and achievements that highlights their strength and areas for improvement. This

positive reinforcement not only boosts motivation but encourages students to actively participate and strive for continuous achievement.

Creating a positive and supportive learning environment is also essential for motivating students in sign language instruction. This can be achieved through effective communication, encouragement, and providing opportunities for active participation. Koff & Mullis (2011) hold that, motivation is the desire for students to participate in and make efforts on learning. The learning experience should be enjoyable and engaging, incorporating interactive activities, games and real life scenarios to enhance motivation and retention of sign language skills. Using visual aids and multimedia resources can captivate students' attention and make the learning process more engaging. Videos, pictures and interactive online platforms can be used to demonstrate sign language in action and provide real life examples. This visual stimulation help students connect with the language and understand its practical applications.

Karim (2012) sees motivation as the inherent belief to guide individual learning goals, induce learning behaviours to make continuous efforts, reinforcing cognition and strengthen and improve the learning outcome. Furthermore, incorporating real world applications of sign language into the instruction can be highly motivating and engaging. Connecting the learning material to practical situations, such as role playing exercises or community engagement, help students see the relevance and importance of sign language in their daily lives. This not only enhances but also deepens their understanding and proficiency in sign language.

Conclusively, motivation and engagement are vital factors in sign language instruction. Setting clear goals and incorporating real world applications, teachers can effectively motivate students to learn and excel in sign language communication.

Sign language and digital resources

Sign language teaching has seen a significant shift in recent years with the emergence of online resources playing a crucial role in enhancing accessibility to students. The traditional approach of teaching sign language often limits individuals who lack access to local classes. The advent of online platforms and resources has revolutionised the way sign language is taught and learned. Cobcroft (2006) affirms that, implementing online facilities in sign language teaching places students at the forefront of pedagogical practice which may garner the academic sphere.

One of the key advantages of online resources is their ability to reach a wider audience. With internet connection now anyone can access sign language materials and courses. This has particularly benefitted individuals who live in remote areas or countries where sign language classes are scarce. Learners learn at their own pace and convenience unlike traditional classroom settings. Online platforms offer self paced courses, allowing students to study wherever and whenever they choose. Traxler (2007) posits that, some subjects and elements may be taught

suitably through a more traditional mode, whereas others may be enhanced by collaboration and discussion.

Additionally, online resources offer a variety of teaching tools and techniques to enhance experience. These resources include: Video tutorials, interactive lessons, quizzes, which help reinforce learning and improve retention. Learners can also benefit from communities and forums where they can interact with other native signers to further enhance their fluency. Though online sign language resources have made it more accessible, they should not replace in-person instruction, face to face interaction with a qualified sign language teacher is crucial for developing fluency.

According to Oblinger et al. (2005), there are potential benefits of teaching time which increases as students can reach lessons outside of class space and time. Hence, online resources be seen as supplement to traditional teaching methods, providing students with additional support and resources to enhance their learning journey. The emergence of online resources has significantly impacted the teaching and learning of sign language.

Vygotsky's Socio-cultural Theory

The major theme of Vygotsky's theoretical framework is that social interaction plays a fundamental role in the development of cognition. His theory emphasises the importance of cultural tools, such as language, signs and symbols, in shaping cognitive processes. Vygotsky's scaffolding theory helps learners understand new information and content by working with an educator who has a better knowledge of the material. The theory holds that students learn quickly when working collaboratively with someone who is more informed, compared to learning the content alone. According to Vygotsky (1978), interaction with peers is of critical importance in the development and learning process, as this theory emphasises that children learn through interaction and collaboration with skilled and knowledgeable individuals. The theory has been used to inspire a focus on interactive and collaborative teaching that encourages students to learn from interactions with teachers. This theory can be applied in the classroom by letting students be the protagonists of their own learning. Teachers should design activities which does not place them in front of the class all the time. They should introduce activities and games that stimulate students' zone of proximal development. The above theory has a significant impact on educational practices, particularly in the areas of instructional design, scaffolding and social interactions in learning environments.

Empirical framework

Previous works from other researchers were used to support and improve on this work.

Yuping Wang & Nobue Miwa (2010) in their research titled "Online Interaction between On-Campus and Distance Students: Learners Perspectives", focused on collaborative learning through online interaction among Postgraduate Students. Results demonstrated that On-Campus students were unwilling to have online interaction with distant students as they did not consider it as important as face to face interaction due to factors such as: time consumption and lack of visibility. The researchers recommended that in order to encourage online interaction between On-Campus and Distance students, collaborative tasks be structured and training should be given to students on the use of online tools.

Egbert & Huff (2009) investigated teachers' awareness of the use of internet in classrooms. They posit that few studies have focused on internet hegemonies and their influences on learners. In their study, they looked at pre-service teachers' media awareness and its influence on their teaching in one University in the United States. Participants were 4 pre-service teachers and 70 students in primary and secondary education. Findings of the study revealed that media literacy be taught in a teacher education program after teachers have developed content and pedagogical awareness in order to help them integrate technology into teaching efficiently and that students should use the internet critically and correctly.

The above studies are relevant to this work because their results indicate the existence of close relations between online parameters.

METHODOLOGY

In this study, a sequential mixed method approach was employed in conducting the research. 25 undergraduate university students in the Faculty of Arts, the University of Bamenda- Cameroon served as participants. They were first year students studying a compulsory sign language course once a week (3 hours). All were hearing students who spoke different languages such as French, English and various Mother tongues. Majority of these students possessed android phones which they used in school and at home. Teaching was done following the blended approach, face to face and online. A total of 25 students took part in the study where 20 (80 %) students had access to cell phones and 5 (20%) did not have. Students were shared online materials for home practice chosen from Websites and Apps: (www.lifeprint.com, www.signingsavvy.com, www.startasl.com, www.handspeak.com). Three Mobile Apps were downloaded and shared to students: ProDeaf translator, The ASL App and Signschool. Sign language dictionaries were also used: The American sign language dictionary by Martin L.A Sternberg, The Gallaudet Dictionary by Clayton Valli & Peggy Swartzel Lott. These online resources provided students with digital video tutorials containing a wide range of sign vocabularies, sentences containing word order, facial expressions and body movements to convey meaning, drills, manual alphabets, fingerspelling words and dialogue exercises. The intention of the program as detailed in the course outline aimed to train students to master and use sign language within lessons and out of the classroom. The course ran for fourteen (14) weeks and the teacher selected items per week to

be covered in class and assigned work from online downloaded materials to be practiced at home. The first week of the program was dedicated to introducing and orientating students on mastering sign language alphabets, numbers, pronouns, vocabulary etc.

The research instruments in data collection included a questionnaire and observation guide constructed by the teacher. Data for the study took two forms. The first was classroom observations based on students signing skills from all the class material covered and sign language practice of online tutorials downloaded from their phones. The goal of classroom observation was established to naturally witness what was happening in the classroom since students had to show progress in their in – class signing skills. The self- delivery method was used with the researcher collecting data from each student as they performed in class activities. Observation notes indicated whether students could sign correctly. The second was questionnaire constructed in English for better understanding of the questions and shared to all the students. An introductory statement comprising the purpose of the research is explained to them. Anonymity was assured. Questionnaires administered comprised questions demanding students to identify items they found challenging during practice, identify signs that were confusing, report on particular digital online resources that improved and ameliorated their signing skills. Data was analysed using descriptive statistics. Statistical Package for Social Sciences (SPSS version 17) was used to analyze quantitative data, and Huberman (2004) three analytical stages of data reduction process were used for qualitative data. Percentages and frequency tables facilitated the comprehension of findings of the study.

FINDINGS

S/N	NAME OF SCHOOL	No. of students
1.	The University of Bamenda	25

Table 1: Distribution of population of students

Table 1 show that there were 25 first year students offering sign language course in the Faculty of Arts. These students were chosen because they were actively involved in classroom teaching and learning process of sign language. The sample of the study was made up of both male and female students. The females formed the majority of the sample as seen on the table below:

Sex of students	Frequency	Percentage
Male	2	8
Female	23	92
Total	25	100

Table 2: The sex of the students

The table above indicates that out of 25 students who made up the sample 2 (8%) were males and 23 (92%) were females. This means that the students were predominantly females.

All the questionnaires administered to students were duly answered and submitted to the researcher. Table 3 shows report of the returns.

QUESTIONNAIRES SCHOOL	Number of questionnaires distributed	Number of questionnaires returned	Percentage returned %
The University of Bamenda	25	25	100

Table3: Report of the questionnaires returned

Of the 25 questionnaires distributed to the respondents, all were answered and returned to the researcher giving a percentage return of 100%.

Three research questions were formulated to understand the difficulties first year students encountered during the teaching/learning process. Answers to these questions are provided using tables of percentages and frequencies.

RQ1: What are the common problem areas where students face challenges during sign language instruction in the university of bamenda?

The question was posed to identify specific challenges faced by students in learning sign language vocabulary, grammar, syntax, fluency and expressiveness, spatial awareness in order to provide potential teaching strategies to overcome these hurdles.

Responses	Frequency	Percent
Vocabulary acquisition	7	28
Grammar & syntax	5	20
Fluency and expressiveness	8	32
Spatial awareness	5	20
Total	25	100

Table 4: Responses where students had difficulties mastering lessons in the classroom

Table 4 indicates that of the 25 students observed during instruction, 7 (28%) had difficulties with vocabulary acquisition, 5(20%) grammar and syntax, 8(32%) fluency issues and 5(20%) spatial difficulties.

Specific challenges faced by students and strategies to overcome them

Students encountered difficulties mastering various aspects of the lessons. This study explored specific challenges and provides potential strategies to overcome these hurdles.

- ❖ Vocabulary acquisition
- ❖ Understanding grammar and syntax
- ❖ Fluency and expressiveness

Strategies used by the teacher to address these challenges

The following strategies were used to support learning challenges faced by students:

- ❖ Interactive learning methods
- ❖ Clear visual demonstrations
- ❖ Practice in context
- ❖ Student to student learning
- ❖ Continuous feedback and evaluation

Students rating of the success of the different techniques used

Responses from questionnaires administered to students on the successes and failures of the various techniques employed to improve learning indicate that 5(20%) students out of 25 said the strategies were unsuccessful, 10(40%) indicated they were highly successful, and 10 (40%) successful.

Success rating	Frequency	Percent
Unsuccessful	5	20
Highly successful	10	40
Successful	10	40
Total	25	100

Table 5: Students rating of the success of the different techniques used

Technological tools used and digital online resources employed to enhance learning

This question investigated students' experiences and preferences in regard to technological tools such as cell phones and laptops used during practice exercises as well as various online resources. Figure 1 presents proficiency of the use of tools

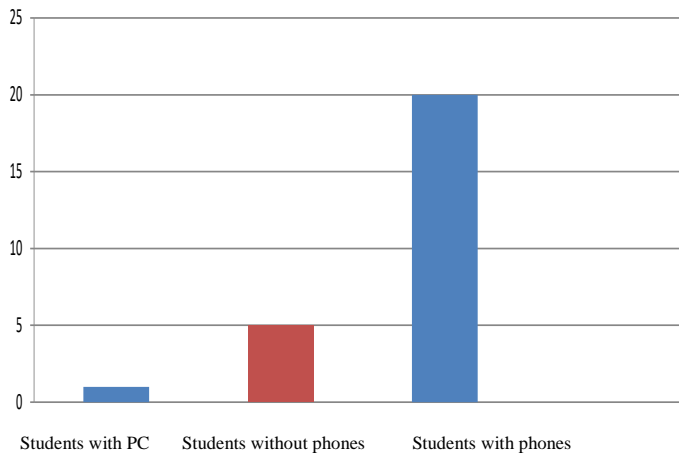


Fig 1: Proficiency use of cell phones

Findings reveal that students depended on the use of their phones for sign language practical exercises. The most used and preferred tool was the phone since no student had laptops. Students watched and practiced sign language video tutorials, vocabulary exercises, signed dialogues, drills and more.

Websites, apps and sign language dictionaries used during instruction

Websites	Mobile apps	Dictionaries
www.startasl.com	Signschool app	ASL dictionary
www.signsavvy.com	ProDeaf app	Gallaudet dictionary
www.lifeprint.com	ASL app	
www.handspeak.com		

Table 6: Ratings of different digital resources used and students' choice of preferences

Out of 9 digital resources downloaded and shared to the students for practical exercises 3(33%) were preferred choices exploited by the students. The best and most exploited were www.startasl.com., Signschool App and ASL dictionary. These websites were reputable online platforms that offered courses on sign language. The sites provided a range of resources and learning materials which helped students learn quickly and easily. The lessons were designed to teach accurate signs and grammar, ensuring that first year students gain a solid foundation in the language.

DISCUSSIONS

Table 4 indicated that of the 25 students observed during instruction, 7 (28%) had difficulties with vocabulary acquisition, 5(20%) with grammar and syntax, 8(32%) faced fluency issues and 5(20%) had spatial difficulties. This study explored specific challenges faced by students and provided potential strategies to overcome these hurdles.

Specific challenges faced by students

Vocabulary acquisition

Learning and retaining a wide range of signs was challenging for the students. The complexity laid in accurately forming and maintaining the correct handshapes and movements. This required consistent practice and a keen eye for detail. They struggled with recalling signs which affected their overall skills. Another challenge was memorising the finger position required for each alphabet sign.

Understanding grammar and syntax

Learning sign language is not just about memorising individual signs; it also involved understanding the grammar and syntax of the language. Students needed to grasp the rules and structure of sign language to effectively convey their thoughts and ideas. Understanding and applying these rules correctly posed problems to students. They struggled with word order, sentence structure, facial expressions, body language, and non-manual markers to convey meaning. Students often struggled to incorporate these elements into their signing resulting in the lack of clarity in their communication.

Fluency and expressiveness

Developing fluency and expressiveness required practice and exposure to authentic interactions. Sign language consists of various signs that appear similar to an untrained eye. Students often struggled to differentiate between signs that had slight variations in finger position and movement. This confusion hindered effective communication and comprehension.

Developing spatial awareness hand-eye coordination

Sign language involves the use of space and movement to convey meaning. Students faced challenges with effectively shifting roles and utilising non- manual markers such as facial expressions and eye gaze. Students must develop precise hand- eye coordination to accurately produce signs. This involved synchronising hand movements with visual cues and spatial awareness. Developing coordination was challenging for beginners.

Strategies used by the teacher to address these challenges

The teacher employed face- to- face teaching, the blended approach and online. Five techniques were used in the classroom for better comprehension and retention.

Interactive learning methods

During lessons the teacher introduced interactive learning methods such as videos, practical exercises that engaged students and enhanced their learning experience. This approach permitted students to observe and practice the correct handshapes, movements and facial expressions from downloaded digital materials shared to them.

Clear visual demonstrations

The teacher provided clear visual demonstrations of each sign inside the classroom during practicals, emphasising the specific finger position and movements. Incorporating slow motion videos or step- by- step illustrations helped the students better understand and replicate their skills accurately.

Practice in context

Students were encouraged to practice signing during lessons and also in real life contexts to enhance their fluency and comprehension. This involved engaging them in attending community events and church sermons where sign language was heavily used.

Student to student learning

Implementing this learning strategy, where more experienced students worked alongside less achievers in and out of the classroom. This collaborative approach fostered a supportive learning environment and allowed students to learn from each others experiences and challenges.

Continuous feedback and evaluation

The teacher provided continuous feedback and evaluation to students, highlighting areas where they required improvement. This feedback loop promoted self reflection and motivated students to strive for mastery in sign language. Mastering sign language could be challenging for students but with the right strategies and support, difficulties can be overcome. By addressing the specific challenges teachers empowered students to effectively master the language.

Students rating of the success of the different techniques used

Table 5 indicated that 5(20%) students out of 25 said the strategies were unsuccessful, 10(40%) indicated they were highly successful, and 10 (40%) successful. These statistics infer that the strategies were highly successful especially to students who had cell phones and successfully exploited all the downloaded material and practiced in and out of the classroom. Pedagogic strategies and digital resources facilitated many aspects of sign language teaching both in the

classroom and at home. A wide variety of contents was taught through online exercises which enhanced students signing proficiencies. Results of this study shed light on how availability of online resources and practice were effective supplements for the acquisition and learning of sign language skills.

Digital resources employed in teaching sign language to enhance students learning

Students depended on the use of their phones for sign language practical exercises. The most used and preferred tool was the phone since no student had laptops. They watched and practiced sign language video tutorials, vocabulary exercises, signed dialogues, drills and more from downloaded websites, apps and sign language dictionaries as shown on table 6. The best and most exploited websites by students were www.startasl.com., Signschool App and ASL dictionary.

Impact of Startasl website to students learning

This website was a reputable online platform that offered courses on sign language. The site provided a range of resources and learning materials which helped students learn quickly and easily. The lessons were designed to teach accurate signs and grammar, ensuring that first year students gain a solid foundation in the language.

- One of the main advantages of Startasl was its comprehensive approach to teaching sign language. Unlike other resources that focused on random signs, Startasl emphasised proper grammar, providing students with a well rounded understanding of the language.
- The lessons offered by Startasl were divided into four levels, allowing learners to progress from beginners to advanced levels.
- Startasl also provided additional support to students through instructor feedback. Students engaged with other students, participated in practice events, and received valuable guidance throughout the semester.
- These lessons were available offline and suitable for home exercises for the students. The platform offered flexible learning options, including access to high quality videos with slow motion and multiple angles which made it easier for them to grasp signs and gestures.

The Signschool App

In today's digital age, technology plays a significant role in education. The Signschool app was a powerful tool that enhanced the learning experience for students studying sign language. This study explored the features and benefits of the Signschool app and how it assisted students in overcoming challenges of learning the language.

1. Interactive learning experience

The Signschool app offered interactive learning experience that engaged students through various multimedia elements. Students accessed video tutorials, interactive games, quizzes that facilitated a holistic understanding of sign language contents. This approach fostered active learning and helped students grasp the complexities of the sign language alphabet.

2. Personalised learning path

The Signschool app allowed students to create a personalised learning path based on their individual needs and progress. Through a series of assessments, the app identified areas where students required additional practice or support. This personalised approach enabled students to focus on specific challenges they faced in learning the sign language alphabet.

3. Comprehensive sign language curriculum

The Signschool app provided a comprehensive curriculum covering all aspects of the sign language alphabet. Students learned the finger positions, handshapes, movements, facial expressions, and non-manual markers necessary for effective communication. The curriculum in this app was structured in a logical manner ensuring a step- by- step progress in learning.

4 .Clear visual demonstrations and explanations

The app offered clear visual demonstrations and explanations of each sign in the language. Through high quality videos, students observed the proper hand movement, finger positioning and facial expressions required for each sign. This visual component enhanced comprehension and aided in accurate replication of signs.

5. Progress tracking and feedback

With the Signschool app, students could track their progress as they advanced through the curriculum. The app provided real time feedback, highlighting areas of improvement and offering suggestions for further practice. This picture promoted and motivated students to continue their learning journey.

ASL dictionary

Students preferred this app for the following reasons:

- The dictionary provided a valuable resource for learning sign language. It provided a comprehensive collection of signs, allowing learners to easily search for and understand the meaning of various signs.
- The dictionary included a wide range of vocabulary covering different categories such as animals, colours, emotions, food and more. Each entry had clear video demonstration of signs, allowing learners to see the proper handshape, movement and facial expressions associated with each sign.
- In addition to individual signs, the dictionary also provided sentences and usage tips helping students to comprehend how signs are used in context. This feature allowed for a deeper understanding of the language and enhanced their ability to effectively communicate.

- The dictionary was user friendly and accessible, making it easy for them to navigate and find the signs they were looking for. It was a valuable tool for expanding vocabulary and improving overall sign language proficiency.

Discussion on the impact of integrating online resources in students' learning

The implementation of credible teaching strategies and integration of online resources improved students learning outcomes. These resources provided useful materials for practice inside and out of the classroom. After a successful semester course completion, students could sign, fingerspell and interpret a host of vocabulary items. The above results are in line with learning expectations suggested by Vygotsky's Socio-cognitive theory, which states that students develop higher cognitive skills through scaffolding within the zone of proximal development (ZPD) due to teachers' approach of assisting students with learning and development and other supportive devices. When students were exposed to these online resources, they were able to interact and collaborate with their mates in class during practice exercises. Students took advantage of the strategies and online resources during their course work to identify their difficulties. Majority of the students found the tasks quite easy and enjoyable whereas others had to practice repeatedly to comprehend the contents. Results from questionnaires indicate that most students were happy with their progress in learning the language. Online practicing task extended and expanded students' knowledge and skills. Students recognized the importance of practicing exercises frequently which was an experience they lacked. Online videos provided them with structured method of practicing sign language skills regularly outside the class especially for students who possessed cell phones.

The above are supported by the reflections of students' claims:

Example 1: *"I think the website is a good platform for me to practice my signing skills.*

I watch signs and learn from the videos".

Example 2: *"I am so happy that I have an opportunity to use this learning source.*

It is very useful and I learn a lot of signing exercises from the websites".

Nevertheless, the enthusiasm of few students decreased 5(20%). This was not due to lack of interest but the absence of some necessary didactic tools like cell phones and laptops. The following reflections supported their claims:

Example 3: *"I can hardly remember most of the signs because I don't have a cell phone nor laptop to practice regularly at home like my classmates".*

Example 4: *"My biggest problem is no that the course is difficult. I will have to buy an android phone or a laptop to enable me practice like my friends".*

Implication to research and practice

This research has wide – ranging implications across various fields. Its contribution to linguistic understanding, education and cognitive science makes it a vital area of study that has the

potential to positively impact the lives of deaf and hearing individuals and society as a whole. The study will advance knowledge in significant areas. It identifies traditional teaching and learning challenges which hinder effective sign language acquisition, outline the importance of a range of online resources used during instruction to impact knowledge. The data and results obtained will be used by future researchers as guide in the same or similar field of study.

CONCLUSION

Identifying specific areas where students faced challenges during the teaching and learning of sign language was of crucial importance to improving and ameliorating their signing skills. Personal engagement was vital in the teaching and learning process. Employing interactive teaching methods, utilising visual aids, fostering open communication, connecting the learning material to students' personal experiences and providing regular feedback, effectively engaged and motivated students in the learning process which also facilitated mastery of the language.

The integration of mobile apps and downloaded online materials offered a comprehensive and interactive learning experience for students. By leveraging technology, students improved their signing skills with the exercises practiced from the app. Startasl was a trusted and reliable resource for students to engage and improve their learning and signing skills. Its commitment to accurate teaching, comprehensive content, and supportive learning made it an excellent choice for students. With its personalised learning path, comprehensive curriculum, clear visual demonstration and progress tracking, the Signschool app empowered students to improve their skills. The ASL dictionary was a reliable and comprehensive resource for students. It served as a helpful guide for understanding and mastering the rich vocabulary of the language. The above online resources were extremely valuable to the students as findings show a mark of improvement at the end of the semester.

Majority of the students expressed positive attitudes and outcomes toward the strategies and online resources provided and integrated with the structured method of teaching. Few students articulated the need to possess android phones in order to practice more often like their mates. Nevertheless, as the semester progressed, their enthusiasm increased as they gradually put in extra efforts into their signing tasks.

REFERENCES

- Block, L., Jesness, R., & Schools, M. P. (2013). One-to-One Learning with ipads. Planning and Evaluation of Teachers Professional Development. College of Education, Leadership & Counseling. University of St. Thomas Minnesota.
- Cobcroft, R. (2006). Literature review into mobile learning in the university context. Unpublished doctoral dissertation, Queensland University of Technology, Brisbane, Australia.

- Egbert, J., Huff, L., McNeil, L., Preuss, C., & Sellen J. (2009). Pedagogy, Process and Classroom context: Integrating teachers voice and experience into research on technology enhanced language learning. *Modern Language Journal*, 93, 754-768. Doi: 10.1111/J.1540-4781.2009.00971.X
- Huberman, A.M. (2004). *Qualitative Data Analysis: An Expanded Sourcebook*, 5th ed., Sage Publications, Newbury Park, CA.
- Karim, S. (2012). Dynamic Assessment of L2 Learners reading comprehension processes: A Vygotskian perspective. *Science Direct*, 321-328.
- Koff, L., & Mullis, R. (2011). Nutrition Education and Technology: Can Delivering Messages via New Media Technology Effectively Modify Nutrition Behaviours of Preschoolers and Their Families? *Journal of Nutrition Education and Behaviour*, 43 (4), 540-540.
- Oblinger, D., & Oblinger, J. (2005). *Educating the new generation*. New York, NY: EDUCAUSE
- Traxler, J. (2007). Defining, discussing and evaluating mobile learning: The moving finger writes.....*International Review of Research in open and Distance Learning*, 8(2).
- Vicars, W. (2003). *Literacy and the deaf*. American sign language, University, www.lifefprint.com.
- Vygotsky, L.S. (1978). *Mind in Society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wang, Y., P., Chen, N. S., & Levy, M. (2010) . Teacher training in a synchronous cyber face-to-face classroom: Characterising and supporting the online teachers learning process. *Computer Assisted Language*, 23(4), 277-293. Doi:10.1080/09588221.2010.493523

WEBSITES

- [www.lifefprint.com]
[www.signingsavvy.com]
[www.startasl.com]
[www.handspeak.com]
<http://gri.gallaudet.edu/presentations/2006>.
<http://asl.dictionary.com>