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http://researchonline.ljmu.ac.uk/id/eprint/15535/

Article

Techno-CLIL in an ESOL Context: Vocabulary Learning and Student Perceptions of the Lifesaver App in a Further Education College

Abstract

While the use of digital technologies is increasingly prominent in higher education, research suggests that adult English for Speakers of Other Languages (ESOL) learners within the English Further Education (FE) sector have fewer opportunities to access them as part of their language learning. This paper explores whether the use of authentic digital materials in a Content and Language Integrated Learning (CLIL) approach helped promote positive learning outcomes for ESOL students at a FE college in the Northwest of England. Using a tablet-based app that teaches students authentic life-saving vocabulary and skills, a mixed methods research design involving a questionnaire, pre- and post-tests and focus groups was used with a group of 32 adult ESOL learners aged 18-61. The main findings from the study were that authentic digital materials were found to contribute to the ESOL learners' motivation and learning outcomes in their study of English. In conclusion several pedagogical implications are identified for ESOL teachers who aim to harness authentic digital materials, as well as for policymakers in terms of the need to provide more opportunities for adult ESOL learners to acquire digital literacy skills in the English FE sector.

1. Introduction

While the number of students within the UK who require English as a second language (ESOL) classes is reported to be approximately 850,000 (Evans et al., 2016), research suggests that many courses are not sufficiently oriented to learners' specific needs and specialised resources in Further Education (FE) colleges are increasingly scarce (Cowie & Delaney, 2019). Earlier research by Spiegel and Sutherland (2006) and Brown (2007), suggested that using digital technologies is challenging in ESOL contexts as learners' lack of opportunity to use computers in their private lives means they do not always have the digital skills required in the classroom. While access to digital technologies by ESOL students in Further Education (FE) has increased in the intervening period, particularly as a result of the more widespread availability of portable devices such as smartphones and tablets, more recent research by the Department for Education (2019) suggests that teachers need to be better supported if they are to integrate them effectively and develop adult students' digital literacy skills (see also McCain, 2009). In this vein, Enyon's (2021, 159) research indicates that the:

> development, implementation and evaluation of digital skills policies for adults [in the UK] need to be revised in order to have a stronger democratic and educational agenda, which includes a stronger explicit commitment to supporting social and technical change that promotes a fairer society for all.

Continuing this social justice agenda, Cooke and Peutrell (2019) argue that ESOL learners can benefit considerably from (a) the exposure to authentic language learning materials that digital technologies can provide, and (b) the community-based engagement digital literacies can lead to.

To explore these two points, this paper investigates the experience of 32 adult ESOL students (aged 18-61) at a college of FE in the Northwest of England and their exposure to a technology-mediated Content and Language Integrated Learning (CLIL) approach (sometimes referred to as 'techno-CLIL') (Cinganotto, 2016; Cinganotto, Cuccurullo & Screpanti, 2017). The study specifically examined their experience of utilising authentic materials in the shape of a tablet-based application (or 'app') used to teach the life-saving skills and vocabulary needed in an emergency situation such as a cardiac arrest or choking incident. The main research question in the study was: How can a techno-CLIL approach contribute to learning outcomes in an ESOL environment?

2. Background
2.1. Authentic life-saving training for ESOL students

Every year in the UK more than 60,000 cardiac arrests occur outside a hospital environment (Resuscitation Council, 2014). Of these, approximately 80% occur in a home environment, while 20% occur in public places. Research from the British Heart Foundation indicates that while few members of the public have the skills or confidence to provide vital life-saving skills for people experiencing a cardiac arrest, a person's chances of survival double if they receive cardiopulmonary resuscitation (CPR). The importance of teaching vital life-saving skills is recognised in current government policy which aims to roll out training to all schools in England by 2020 to boost awareness of the importance of CPR training.

In 2010 the number of ESOL students in colleges of FE within the UK was 850,000 of which approximately 55,000 were from Pakistan (BIS, 2010). According to the British Heart Foundation (Resuscitation Council, 2014), while South Asian people have less access to coronary heart health care, they have a 50 per cent higher chance of having a heart attack than people in the general population. People from South Asia experience poorer levels of care when accessing medical services for heart disease and in the case of migrants there appears to be an inverse relationship between increased health care need and the care that is actually received.

Giles (1996) argues that refugees are best served by language courses which encourage them to learn skills which will be valuable to themselves and their new communities. Therefore, in order to help the integration of refugees in the UK, DuBois (1993) argues for a challenge to the view that refugees are incapacitated by grief and are instead seen in the words of Preece and Walters (1999), as a potential resource that can enhance and develop their host country.

2.2. Authenticity, motivation and CLIL

ESOL students are distinct from other types of English learners because they learn the language at the same time as living in an English-speaking country. They attend formal classes, but they also study in a naturalistic context (Block, 2003), learning English without formal instruction in their everyday interactions. Often economic and political migrants find communication outside the classroom to be a stressful and asymmetrical experience and must call upon their life skills and learning strategies in order to survive (Block, 2003; Janosy & Thomas, 2020). Baynham et al. (2007) argue that many ESOL students have few opportunities to interact with native English speakers other than authority figures such as their manager at work, their doctor or police officers in their local communities. While most ESOL course books focus on form and provide examples of appropriate phrases to be used in different settings, for example, when visiting a doctor, this may inadvertently create challenges for the overprotected learner when s/he is confronted with real-life situations (Bacon & Finneman, 1990).

The debate surrounding authenticity in language learning materials is well-established and continues to be a point of contention not least because it is difficult to agree on a single definition of the term (Khojah & Thomas, 2021; Roberts & Cooke, 2009). In this paper the definition of authenticity offered by Tomlinson and Masuhara (2010) will be used, namely, that authentic materials are designed not to explain how language is used but instead to provide the learner with an experience of the target language and, as such, they promote language acquisition and motivate learners (Dörnyei, 1994; Tomlinson, 2013). According to Lasagabaster (2011), the most appropriate language teaching approach to help realise this potential is CLIL, an approach that combines learning about a particular subject and the target language. His findings indicate that students' learning outcomes were significantly improved in classes in which CLIL and a focus on spoken interaction were used alongside authentic materials (see also Lasagabaster, Doiz & Sierra, 2014). Similar findings were found in studies by Coyle (2008), Pinner (2011) and Marsh (2008), whose research reinforces the importance of using authentic materials to improve vocabulary acquisition in CLIL contexts.

2.3. Vocabulary learning for ESOL students

Following Giles (1996), ESOL students need to learn vocabulary that is useful to them in their daily lives and enable them to communicate with formal agencies and people in authority. In emergency situations migrants need to be able to communicate effectively in English with emergency services via the national 999 service, ambulance staff and potentially, anyone who can provide them with life-saving procedures. Research into the field of language and 999 calls in particular is sparse but suggests that during a call in the United Kingdom the ability to understand the word 'unconscious' was between 46.5% and 87% and that for people whose first language was not English, the score was at the lower end of the scale (Cooke, Wilson, Cox & Ralfe, 2000).

Broadly speaking, vocabulary can be divided into four categories: high frequency words, academic words, technical words and low-frequency words (Nation, 2001). The vocabulary used in CPR may be positioned under Nations' technical word category (Nation, 2008) which describes vocabulary used predominantly in work situations or for hobbies. The number of words in any technical category can be small or very large and may appear in multiple categories. For example, words like 'chest' or 'heart' can be described as high-frequency and technical words.

The majority of vocabulary learning strategies include the need to scrutinise the word to be learned, and as Gu and Johnson (1996) suggest, involves using multiple strategies to help learners not only learn the word but retrieve it effectively later. This idea is supported by Nation (2001) when he suggests that teachers should aim to present learners with a variety of methods

for learning unfamiliar technical words. These strategies include learning words from context, looking up words in dictionaries and using flash cards.

More broadly there are numerous goals within the process of learning new vocabulary. Pronunciation of the new word or learning how to spell it are both components of the vocabulary acquisition process that are required. To improve clarity for students Nation (2001) suggests that it is preferable to isolate the learning goals so that they are targeted sequentially, one at a time. Doing so can help teachers to provide the most favourable learning conditions in which to learn vocabulary by following three important stages in their teaching (Nation, 2001): helping students to notice words, helping them to remember words, and helping them to use the word appropriately.

There are many ways to distinguish technical vocabulary from high frequency vocabulary. However, Chung and Nation (2004) suggest that 90% accuracy can be achieved by adopting a frequency and range-based method to make the distinction. Technical vocabulary is more closely connected to a particular domain such as medicine in the case of words like 'windpipe' and 'stomach' and these words occur more frequently within this specialised domain than they do out of it.

Research on CLIL and vocabulary builds on the earlier work of Nation and others as mentioned above. While research on CLIL and vocabulary has emphasized the benefits of the approach, it has also explored lexical competence (Jiménez Catalán & Ruiz de Zarobe, 2009; Olsson, 2015), the implications for vocabulary knowledge (Xanthou, 2011), the positive implications of CLIL on vocabulary acquisition (Moghadam & Fatemipour, 2014), the vocabulary-related benefits of combining content and language learning (Llinares & Dalton-Puffer, 2015) and the vocabulary challenges presented by subject-specific classroom discourse (Nikula, 2012, 2015). Notable gaps include the lack of research on subject-specific vocabulary strategies and performance (Dalton-Puffer & Smit, 2018; Gablasova, 2014; Heras & Lasagabaster, 2014), as this area presents significant challenges due to CLIL's use of compound words arising from the mixing of several disciplines (Nation 2016).

Nevertheless, Lasagabaster (2008) and Heras and Lasagabaster (2014) suggest that CLIL can improve the acquisition of specific language terminology due to its situation-based learning approach. Vocabulary acquisition of general items may also be more efficient due to the fact it is taking place in more authentic and meaningful contexts rather than decontextualised classroom environments. Other studies have found gains in the CLIL classroom related to receptive vocabulary (Jiménez Catalán & Ruiz de Zarobe, 2009) but there are few studies on the use of CLIL and technical vocabulary and Lasagabaster (2014) calls for more experimental research on this

subject involving pre- and post-test designs to overcome existing methodological and theoretical challenges.

The above review has revealed that there may be few opportunities for adult ESOL learners to communicate in English in authentic situations outside the classroom. There is little agreement regarding the definition of authentic materials, and it is clear that there are conflicting views about the level of familiarity that ESOL learners have with technology and their enthusiasm to use technology to learn English. Research also suggests that migrants may have poorer health and poorer access to health care in their host country. Strategies for teaching technical vocabulary are numerous and varied and clearly valuable for ESOL students but more research is required in this area. Faced with this task, research indicates that CLIL emerges as a potentially powerful pedagogical approach, particularly when combined with digitally-mediated approaches (Cinganotto, 2016; Pamintuan et al., 2018).

3. Methodology

3.1. Institutional context

To address the gaps highlighted above, the study was conducted in a FE college in the Northwest of England that teaches mainly vocational courses. The college opened in 1974 and has approximately 9,000 students, a quarter of whom come from the most deprived area of the city. According to Ofsted (2016), the percentage of adults without any qualifications is higher in the city than any other part of the country. The main research question guiding the study was: How can a techno-CLIL approach contribute to learning outcomes in an ESOL environment?

3.2. Participants

The adult ESOL classes consisted of students from a wide range of backgrounds including asylum seekers and economic migrants with a variety of L1s and were taught by one of the researchers. The educational experience of the students varied from no formal education to doctoral level and consisted of three separate groups of adult students ranging from 18-61 years old: Group 1 (f=9, m=4), Group 2 (f=11, m=2) and Group 3 (f=13, m=2). The group also included 3 students from a South Asia background, given the higher incidence of cardiac problems in this community as noted in the literature review (Resuscitation Council, 2014). The language proficiency level of the students had been previously assessed using the college's standard ESOL diagnostic test which was administered prior to enrolment by teaching staff and identified that students' linguistic ability ranged from B1 to B2 (lower to higher intermediate) according to the Common European Framework of Reference (CEFR).

3.3. Data collection

Lifesaver is an interactive game first released in 2013 as a result of collaboration between the Resuscitation Council UK and the production company UNIT9. Updated in 2017 and 2020, it is available as a web-based version (https://life-saver.org.uk/) and as a mobile application for Apple and Android devices. For this study the mobile app version was used on Apple iPads that were provided to the participants who worked in pairs.

The app incorporates video content with gamified elements to provide training at a nationally recognised standard aimed at helping members of the public and school children to respond to emergency situations. The interactive video scenarios provide information about what to do in an emergency, such as putting someone in the recovery position, steps to take if someone is choking, calling for the emergency services, using a defibrillator and performing CPR procedures. In the scenarios actors perform short sketches of realistic medical emergencies, and the video pauses at key decision-making points, inviting users to select the option they think is most appropriate to save the person's life. If the user has chosen the correct option, they receive praise and proceed to the next stage of the story; if not, the app provides corrective feedback and asks the user to choose a different answer. All of the activities in the app are timed and background music is used to add dramatic effect to the situations. A score is calculated to visualise participants' engagement and to check the speed of their responses during the video episodes. In this study, participants viewed two videos: one on providing CPR to a man who had had a heart attack and a second to a girl involved in a choking incident.

The students participated in the research during their timetabled lessons within the college. Data were collected using a sequential mixed methods design and English was used throughout the data collection process. Informed consent to participate in the study was received from participants and managers at the college in line with the ethical requirements of the British Educational Research Association (BERA) in relation to anonymity, confidentiality and data protection. All participants completed consent forms and were provided with information regarding the aims and processes involved in the study. The questionnaire was checked for face validity and any double-barrelled, confusing, and leading questions were removed as a result of pilot testing.

Data collection involved several stages. First, students completed a questionnaire on their use of digital technologies (10 minutes) to determine their skills level (see Appendix A). Next, students completed a paper-based pre-test on vocabulary designed by the researchers to evaluate their knowledge of words associated with choking and cardiac arrest (30 minutes) (see Appendix B). Following this, the students used the Life-Saving app on their tablets to complete the video scenarios for choking and cardiac arrest emergency situations (90 minutes). The students worked in pairs, taking it in turns to hold the device, watch the videos and work together to choose the correct options in the scenarios. In the following class session (one week later) students were asked to

repeat the vocabulary tests in a 30-minute time period (e.g., the post-test). Finally, students from each class took part in focus groups involving 5-6 participants to discuss their experience of using the Lifesaver app (45-60 minutes). Apart from the vocabulary test, there was no formal follow-up by the instructor, except for discussions about the use of the app and the students' prior experiences of encountering emergency medical situations.

3.4. Data analysis

In this mixed methods design, the questionnaire data about participants' ICT skills was analysed through the use of descriptive statistics (means, standard deviation), while a comparison of means was undertaken using a *t*-Test for the pre- and post-test data arising from participants' vocabulary scores. The three focus group sessions were audio recorded and transcribed in line with Braun and Clarke's (2006) approach to open coding to generate three main themes to answer the research questions. Guba and Lincoln's (1994) framework was followed to establish credibility, transferability, dependability and confirmability.

4. Findings

4.1. Technology questionnaire

The technology questionnaire confirmed that the ESOL students' ownership of technology was high: 90% of students owned a computer; 97% owned a mobile phone; 62% owned a tablet; and 100% responded that they regularly used the internet. These data suggest that the students had independent access to a wide range of digital technologies which could be utilised to promote language acquisition. Although the majority of the students were refugees, this did not impact on their access to technology, a finding that contradicts Ono and Zavodny (2008) who argued that the prohibitive cost of technology means that ESOL learners are likely to have limited access to computers and the internet. The claim made by McClanahan (2014) that teachers and managers believe that their students are either "too old" to learn how to use technology or that "they didn't own computers at home" also appears unfounded in relation to the ESOL students in this study. Likewise, the students rated their own digital literacy skills as 'high', with 28 (87%) ranking their skills as "excellent" or "very good". Nevertheless, in terms of their classroom instruction, 41% indicated that they had used technology in their lessons, while 59% had not. 94% of students agreed that teachers should use technology more often in the ESOL classroom.

4.2. Pre- and post-test results

Table 1 shows the pre- and post-test results arising from the vocabulary tests. The pre-test was used as a diagnostic tool to ascertain what language the students knew prior to the instructional

aspect of the course. The vocabulary test was created especially for the study and consisted of low and high frequency words requiring the teacher to adopt different teaching strategies. This distinction was recognised in the study by ensuring that the vocabulary was contextualised, and students were encouraged to use strategies to understand meaning-in-context.

The post-test incorporated two of the three characteristics Elgort and Nation (2010) identified: firstly, the test evolved from the material used in the instruction, and secondly students knew that they would be given the same test post-instruction. Elgort and Nation (2010) also identified achievement tests as useful because they helped to motivate learning through the washback effect.

ITEM	PRE-TEACHING SCORE		POST-TEACHING SCORE	
LIFESAVER VOCABULARY IN THE TEST	*Percentage of students answering incorrectly*	*Percentage of students answering correctly*	*Percentage of students answering incorrectly*	*Percentage of students answering correctly*
THROAT	47%	53%	25%	75%
WINDPIPE	47%	53%	28%	72%
LUNGS	19%	81%	16%	84%
CHOKING	34%	66%	18%	82%
COUGH	38%	62%	12%	88%
SHARP BLOW	84%	16%	87%	13%
ABDOMINAL THRUSTS	75%	25%	28%	72%
FIST	44%	56%	16%	84%
BELLY BUTTON	28%	72%	0%	100%
BREASTBONE	56%	44%	9%	91%
BACK BLOWS	82%	18%	18%	82%
COLLAPSES	25%	75%	10%	90%
AMBULANCE	22%	78%	0%	100%
CPR	56%	44%	3%	97%

Table 1. Choking Vocabulary Test

Table 1 offers a breakdown of the test scores related to the vocabulary test on choking-related word items. The pre- and post-tests indicated that as a group the students improved their scores in all but one of the words ('sharp blows'). This may have been because the students confused the item 'sharp blow' with 'back blow'. The word 'ambulance' was used correctly by 100% of students following instruction.

ITEM	PRE-TEACHING SCORE		POST-TEACHING SCORE	
CARDIAC ARREST	*Number of students*	*Number of students*	*Number of students*	*Number of students*

VOCABULARY IN THE TEST	answering incorrectly	answering correctly	answering incorrectly	answering correctly
COLLAPSES	22%	78%	10%	90%
RESPOND	16%	84%	12%	88%
SHOULDERS	10%	90%	3%	97%
AIRWAY	34%	66%	12%	88%
RECOVERY POSITION	44%	56%	22%	78%
AMBULANCE	16%	84%	3%	97%
DEFIBRILLATOR	44%	56%	16%	84%
AED	34%	66%	6%	94%
CPR	31%	68%	6%	94%
RIBS	25%	75%	9%	91%
MOUTH-TO-MOUTH	31%	68%	10%	90%
NOSTRILS	37%	63%	16%	84%
PADS	34%	66%	22%	78%
DHOCK	47%	53%	22%	78%
PARAMEDICS	34%	66%	16%	84%
CARDIAC ARREST	37%	63%	16%	84%

Table 2. Cardiac Arrest Vocabulary Test

Table 2 offers a breakdown of the vocabulary test relating to cardiac arrests. The pre- and post-test frequency scores for cardiac arrest vocabulary clearly demonstrate improvement in every item tested. Interestingly, while 16% students were incorrect when using the word 'ambulance' in the pre-test, the score improved to 97% correct in the post-test. These were the same students using the same word, but in a different scenario, and the result illustrates that a word can be known for a short time in one context, and then slip out of the student's readily accessible vocabulary when needed for use in a slightly different context. In sum only 3% of students used the word 'ambulance' incorrectly in the post-test for cardiac arrest, suggesting that 13% of students were able to re-learn or refresh their learning easily. One student continued to make a mistake with the word despite having correctly used it in the post-test for choking. This may have been due to the change in context, a lapse of concentration, or a result of test anxiety.

SS NO.	PRE-TEST CHOKING	POST-TEST CHOKING	DIFFERENCE CHOKING	PRE-TEST CARDIAC ARREST	POST-TEST CARDIAC ARREST	DIFFERENCE CARDIAC ARREST
1	12	11	-1	16	15	-1
2	8	10	2	9	14	5
3	12	12	0	13	15	2
4	13	10	-3	16	15	-1
5	16	11	-5	16	15	-1
6	8	8	0	4	6	2
7	16	11	-5	14	15	1

8	11	9	-2	4	11	7
9	13	10	-3	8	14	6
10	2	8	6	8	11	4
11	11	12	1	14	15	1
12	8	11	3	12	14	2
13	7	7	0	6	15	9
14	6	11	5	15	15	0
15	9	12	3	16	12	-4
16	8	8	0	12	13	1
17	14	7	-7	12	4	-8
18	2	7	5	6	15	9
19	4	9	5	4	15	11
20	14	11	-3	16	15	-1
21	2	8	6	3	8	5
22	6	11	5	24	15	-9
23	6	9	3	6	8	2
24	9	11	2	12	15	3
25	2	6	4	2	6	4
26	7	11	4	4	15	11
27	12	13	1	16	14	-2
28	5	11	6	12	15	3
29	8	10	2	8	15	7
30	12	11	-1	15	15	0
31	4	11	7	14	15	1
32	2	7	5	6	15	9

Figure 1. Pre and Post-test Scores, Participants by Row

Figure 1 shows the number of correctly used words in the pre and post-tests. It presents the raw pre- and post-treatment scores for choking, and for responding to a cardiac arrest with each participant numbered in the left column. There is also a 'difference' column which shows the extent of any changes in each student's score. In the choking training, 19 students improved their scores in the vocabulary tests, 4 students registered no change, and 9 students scored less after the teaching. One explanation to account for the 9 students who scored lower is the confusion caused by using language that was unclear in the app. For example, 'sharp blows' is easily confused with 'back slaps', and 'throat' and 'windpipe' are also very similar in some respects, both of which accounted for many of the errors.

In the Cardiac Arrest section, 8 students scored lower in the post-test, and 2 stayed the same, with the remaining 22 improving. In total 5 students scored lower on both sets of tests, suggesting that the approach to learning was not helpful to them. One further notable score set is that of student 17 who scored significantly worse on both of the post-test vocabulary tests. It may be that the learning activities simply confused him/her.

A comparison of means was also undertaken using a *t*-Test to indicate the significance of the difference in scores within the paired (pre- and post-test) scores. Several interesting features are worthy of note. The mean scores for 'choking' (pre- and post-test for the group) rose from 8.4

to 9.8, an increase of 1.4 or 16%. Interestingly, the standard deviation decreased from 4.2 to 1.8. This suggests that the scores were not only higher (as shown by the mean scores), but also less widely scattered and therefore consistently higher across the group, as the marks were higher, and the students' scores were similar to each other. Furthermore, the level of significance calculated by the *t*-Test was *p*=.039.

The above analysis was subsequently repeated using the Cardiac Arrest pre- and post-test scores. The mean scores for Cardiac Arrest (pre- and post-test for the group) rose from 10.7 to 13.1, an increase of 2.4 or 22%. Similar to the Choking data, the standard deviation was reduced from 5.2 to 3.2. Again, this suggests that the scores were not only higher (as shown by the mean scores), but they were also less widely distributed and therefore consistently higher across the group as the marks were higher and the students' scores more centrally aligned. Furthermore, the level of significance calculated by the *t*-Test was *p*=.008.

Arising from the open coding of the focus group data, three main themes were identified in the qualitative data: the use of computers, authentic digital materials and collaboration and CLIL.

4.3. The use of computers

Contrary to the view expressed in the literature review, namely, that many educators believe their ESOL students to have limited access to computers due to the prohibitive costs involved (Ono & Zavodny, 2008), as well as an underdeveloped working knowledge of technology (McClananhan, 2014), students in this study expressed positive views. The students (P1-P3) expressed their aspiration to use computers within their English lessons and believed them to be beneficial to their learning experience:

> *It's easy to use tablets ... we've used them before.* (P1)
> *It was good practise (to use the tablets).* (P2)
> *Today we really enjoyed (using tablets).* (P3)

The data indicated that the majority of students welcomed the use of computers and there was no mention that using technology, in this case tablets, posed any immediate challenges to them. Furthermore, the students appeared to recognise and agree with the view expressed by Parrish (2004) that the benefits to ESOL learners in accessing and gaining computer skills for the workplace should not be underestimated:

> *Good practise (to use the tablets).* (P2)
> *It's the 21 Century (we need to use computers).* (P6)

> *Using the computers is more fun … and kind of more interesting… it is more interesting than just repeating.* (P7)

These quotes suggest that there is some merit to Merriam, Caffaralla and Baumgartner's (2007) argument that ESOL students were motivated by the opportunity to enhance their professional skills through the use of technology.

4.4. Authentic digital materials

Discussions within the focus groups also demonstrated students' appreciation of authentic digital material to learn English.

> *It's not just seeing the word, it's applying it in real life.* (P4)
>
> *It's very hard to understand (what ambulance people say) before training it was not easy to understand … now I understand.* (P5)
>
> *It was quite interesting (using the tablet), it's like the situation is really happening ... you kind of know what to do … and this can help save lives.* (P8)
>
> *It would make learning more interesting; I think my brain focuses on it as it is interesting but if I am bored my brain doesn't remember.* (P10)
>
> *I feel like I am there. (*P18)
>
> *It's more natural.* (P22)
>
> *Scary, more stressful and its good.* (P16)
>
> *It's a real situation.* (P32)
>
> *It's easier to remember (vocabulary) doing this.* (P29)
>
> *More confident to feel more comfortable because we can see everything that is going on as well and we can read.* (P17)

These students seem to echo the view of Tomlinson and Masuhara (2018) who describe authentic materials as being designed not to explain how language is used but instead to provide the learner with an experience of the target language:

> *It's better with the video because you can see the gesture of the people.* (P19)
>
> *If you see it a few times you can actually go and do your CPR.* (P11)
>
> *It's exactly the same way as learning English when you are watching a movie and reading at the same time as subtitles.* (P7)

Many of the comments were in direct contradiction to Day's (2003) view that authentic materials are too difficult for students:

> *If you see it a few times you can actually go and do your CPR.* (P11)
>
> *I am more confident, and I feel more comfortable because we can see everything that is going on as well and we can read.* (P15)
>
> *It's not just seeing the word; it's applying it in real life.* (P20)

These excerpts suggests that students enjoyed using authentic materials for vocabulary learning and believed them to be beneficial to their language acquisition overall.

Other important strategies for learning vocabulary include Allen's (1983) belief that there must be a strong personal need for students to learn new words. The following excerpts underlined students' personal motivation to use the Lifesaver app in English because of its real-world application:

> *This can help save lives.* (P31)
>
> *It's good to learn because we could help someone who is unconscious or collapsed.* (P30)
>
> *It is important for us to know how to help someone.* (P27)
>
> *It's my first time (to learn like this), helping and talking with people outside class and more preparation for real life and learning in more normal situations (was given).* (P23)
>
> *I enjoyed it more than regular lessons as its different and helpful.* (P12)
>
> *The subject is very interesting.* (P6)

These quotes also illustrate the point made by Schmitt (1997) that new words should be learned by using them in real life situations. The act of being able to retrieve new words from memory is highlighted by Nation (2000), who argued that it is more important to retrieve the word than the initial learning of the word. Students in this study mentioned that they valued the opportunity the app afforded them to repeat the activity as this helped them with retrieval:

> *Repeating actions is more memorable, so it's easier.* (P22)
>
> *Repeating things … repeat and say the words as well repeat does make me remember more.* (P12)
>
> *I learn and remember the words.* (P28)
>
> *I would recognise the words if I saw them again.* (P31)

However, a few students echoed Day's (2003) view of authentic materials as also bringing challenges to their learning process:

> *It's more difficult for us but it's good.* (P11)

Better if key words like AED come at the end with an explanation as well as what it means and how to spell it. (P5)

I'm sorry to say that I was just listening like a narrative … I didn't listen to everything that the girls said. I think about what to do next. (P16)

4.5. Collaboration and CLIL

A common theme which emerged from the focus groups was the value of students' collaborative pair work as the following excerpts indicate:

> *It was really good (to work in pairs) because sometimes it (the video) is running pretty fast, and you don't have time to think actually that fast and if you have somebody … there are two brains.* (P11)
>
> *I think together we can learn about this vocabulary.* (P27)
>
> *It's a hard topic and subject to learn and now it's better when we are doing that in a group.* (P19)
>
> *Together with others … I help them if I know something, and they help me…I think in a group with iPads, and it shows us. If I do it at home and I don't know anything (I have problems), but you help me, and other people help me and it is better.* (P26)
>
> *More important to work in pairs … you get more ideas from one another.* (P24)

Coyle (2002) asserts that the effectiveness of CLIL depends on communication, and this was particularly in evidence during students' collaborative use of the Lifesaver app, which enabled them to support each other in completing the tasks in the target language.

5. Discussion

This study has explored the use of authentic digital materials as part of a techno-CLIL approach for adult ESOL students in the FE sector in England. In connection with the over-arching research question (How can a techno-CLIL approach contribute to learning outcomes in an ESOL environment?), the qualitative data suggested that the language skills learned in responding to emergency situations affected the students' sense of self-worth in relation to their family and to the wider community in which they live (Cowie & Delaney, 2019). There was a strong sense of being able to help others, and that being 'able' in that way increased the contribution that they felt they could make (Enyon, 2021), whether that was in dealing directly with the patients or responding to the ambulance staff in a helpful manner in the video-based materials.

The importance of using technology in the classroom is reinforced by Mayer (2003) who argues that most students are visual and multimodal learners who benefit from pictures and audio rather than a purely text-based approach. However, Elgort and Nation (2010) argue that using actions to convey meaning helps learners to remember meaning effectively. Paivio and Desrochers (1981) develop this point by adding that a verbal or written definition together with the action will help the student to remember the vocabulary both linguistically and visually through the process of dual encoding.

The participants found the experience of learning authentic emergency life-saving skills at the same time as learning English a more enjoyable experience than their usual ESOL lessons. They expressed the importance of being able to apply the new vocabulary immediately and in context. Indeed, the improvements in their test scores confirmed the effectiveness of the techno-CLIL approach which did not use any prior vocabulary instruction. The mean scores for 'choking' (pre- and post-test for the group) showed an increase of 16%, while the mean scores for Cardiac Arrest showed an increase of 22%. Students reported that a more realistic and natural situation was key in helping them to communicate outside the classroom and that it would prepare them better for real life transactions. This suggests that a techno-CLIL approach that uses authentic tasks is a desirable one for ESOL teachers who wish to use digital materials to motivate their learners and enhance vocabulary retention.

The students reported that the use of technology was both interesting and motivating. They described the multimodal use of audio, video and action-oriented learning as central to their learning experience and this had a positive effect on the student's self-reported motivation and helped to sustain their levels of engagement throughout the ESOL course (Darmanto, 2020).

The limitations of the study included implementing the research in the workplace of one of the researchers. This impacted upon the study from the point of view that the researcher was also the practitioner and as such played two roles at the same time. Furthermore, the participants and researchers identified with one another as students and teachers and operated in a shared space. This relationship may have caused undue pressure upon students as participants to say or report what they believed their teachers/researchers wanted to hear (Mackey & Gass, 2005). A further limitation was that there was only one week between the pre- and post-test and this limited time may have further assisted the students' ability to recall the targeted vocabulary.

The experience of using technology in class was also new to many of the ESOL learners and this could have affected the participants in two main ways. Firstly, learners may have felt reluctant to use the tablets because of their limited knowledge. Alternatively, the participants' favourable responses to the tablet-based app may have been influenced by the technology's 'wow' factor, and more longitudinal studies will need to be considered in future (Bax, 2011). It

was important to gauge the level of participants' ICT awareness in the questionnaire and this will be part of a further research study on ESOL learners.

6. Conclusion

This study examined how a techno-CLIL approach incorporating the use of the innovative mobile Lifesaver app can contribute to positive learning outcomes in an adult ESOL environment. To understand this process more holistically, the study also sought to examine learners' ICT skills and their use of authentic language learning materials. The main findings from the mixed methods approach indicated that the approach contributed to learners' vocabulary retention and their use of real-life situation-based learning involving digital technologies was motivating and engaging.

Further research is needed to consider the ways in which ESOL teachers can build on students' self-worth and increase the contribution that they feel able to make in their host community and country. More work is needed to understand how to capitalise on the capabilities of ESOL students in technology-mediated CLIL classrooms. Associated with that issue is a broader research question about how teachers can assist adult ESOL students to increase their sense of social capital and personal value in society through the use of real-world activities similar to those these participants experienced with the Lifesaver app.

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Appendix A. Technology Questionnaire

Personal information
Name:
Age:
Nationality:
How long have you been learning English?
0-2 years   2-5 years   5-8 years   8+ years

Information about your use of technology
I have a computer at home that I use: **Yes/No**
If yes, how often do you use it?
Every day   a few times a week   a few times a month   never

I have a Smart Phone: **Yes/No**
If yes, how often do you use it?
Every day   a few times a week   a few times a month   never

I have a tablet: **Yes/No**
If yes, how often do you use it?
Every day   a few times a week   a few times a month   never

I use the Internet: **Yes/No**
If yes, how often do you use it?
Every day   a few times a week   a few times a month   never

I use the internet for (circle any of the following):
shopping   learning English   YouTube   Google   e-mail
maps   Facebook   watching TV/Movies   weather playing games

Your ability to use technology

Please circle the phrase which best represents your ability.

I can use the Internet.	**Very well**	**OK**	**Not very well**
I can use my smart phone.	**Very well**	**OK**	**Not very well**
I can use my tablet.	**Very well**	**OK**	**Not very well**
I can use my home computer.	**Very well**	**OK**	**Not very well**
I think I am good at using my computer.	**Very well**	**OK**	**Not very well**

Have you used a computer in class to learn English? **Yes/No**

Did you enjoy using it? **Yes/No**

Do you think it's a good idea to use a computer in class to learn English? **Yes/No**
If yes, why?

Please use the space below to add any further information you would like to provide regarding your use of technology.

Appendix B. Pre- and Post-Choking and Cardiac Arrest Tests

Choking Test
Use the words and phrases in the box to complete the gaps in the text. You might have to change the tense of the word.

> abdominal thrusts, windpipe, sharp blow, breast bone, cough, choking, fist, belly button, CPR, back blow, lungs, ambulance, throat, collapse

A group of three friends and talking. One of them, called Rebecca, is eating a hot-dog. Suddenly Rebecca starts to hold her throat and she looks like she can't breathe. She has blockage in her windpipe and no air can get in or out of her lungs.

You come into the room and try to help. You ask Rebecca if she is choking, and her friends say she is. You tell Rebecca to try and cough but she can't and so it is a very serious situation.

You stand behind Rebecca and support her with one hand, and you give a sharp blow to the centre of her back with the flat of your hand. You check to see if any food has come out of her mouth, but it hasn't so you do it again, but still no food comes out and she is still choking.

You decide to give abdominal thrusts. You make your hand into a fist and put it between her belly button and her breastbone pulling up sharply. You check for any food that might have come out but nothing has and so you give five more back blows. Rebecca collapses and you tell her friend to call for an ambulance.

While you wait for the ambulance, you begin CPR. Rebecca starts to cough by herself and the food that has been choking her, comes out of her mouth. She is OK because you knew what to do and you saved her like. Well done!

Cardiac Arrest Test
Use the words and phrases in the box to complete the gaps in the text. You might have to change the tense of the word.

> Cardiac arrest, respond, mouth-to-mouth, ribs, CPR, ambulance, collapse, shoulders, paramedics, nostrils, airway, defibrillator, AED, shock, recovery position, pads

A man called Jake is walking down some steps with two of his friends. Suddenly he feels unwell and he collapses. His friends think he is playing a game and they tell him to get up and stop messing around. They call his name to try and get him to respond. They ask him if he can hear them and to open his eyes.

You come around the corner and see Jake on the floor with his friends looking worried. You decide to try and help. You kneel-down next to Jake and you try to get a response by shaking his shoulders. You ask Jake if he is alright, but he does not respond.

Next you turn Jake over onto his back and open his airway by tilting his head back and opening his mouth. With your fingertips under his chin, you look and listen for signs of breathing. If Jake was breathing, you could put him into the recovery position so that he is lying on his side. Jake is not breathing normally so you decide to call for an ambulance.

You tell Jake's friends to find a defibrillator which is also called an AED. This can be found at a station or shopping centre. It will be in a box with a heart on the front.

While you wait for the ambulance to arrive you decide to start CPR. You know what to do so you place the heel of your hand on the centre of his chest and push down. You will have to push hard, and you might break his ribs, but this does not matter.

Next you give Jake mouth-to-mouth and so you pinch his nostrils and put your lips around his mouth and give a normal breath so that his chest rises. Then you do this one more time. Jake is still not responding so you do 30 more presses on his chest.

You tell Jake's friend to open the defibrillator box and switch it on. You tell Jake's friend to put the pads on Jake's chest. The defibrillator tells you to stand clear of the patient and you tell Jake's friends not to touch him. Next you press the shock button but Jake is still not responding and so you continue with CPR.

The paramedics arrive and take Jake to hospital. Jake has had a cardiac arrest, but he gets better. This is because you knew what to do and you saved Jake's life. Well done!