Towards a pedagogy of complementary alternative Adult Literacy learning spaces (CALLS) in ESOL and Literacy learning: A case study of the use of a computerised environment (SCRATCH) in an ESOL class

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Since the seminal intervention of Street (1984, 1995), which introduced the concepts of autonomous as against ideological perceptions into the discourse on adult literacy, there have been unceasing contributions to the debate, particularly at theoretical and intellectual levels. In the context of this paper, perhaps the most relevant contributions have come from the New London Group (NLG) (See Cope & Kalantzis, 2009; Kalantzis & Cope, 2005; and Cazden, Cope, Fairclough, & Gee, 1996). Developing from a recognition of divergence in the ways in which literacy is used and appreciated, NLG introduced the notion of literacy as social practice (Barton & Hamilton, 2000), and the concept of multiliteracies (Cope & Kalantzis, 2009; Kalantzis & Cope, 1996; Cazden et al.,1996). This is without prejudice to the importance of the contributions of other scholars like James Paul Gee (1989, 2003) and his notion of discourses and the social perspective to literacy which have also contributed immensely to the discourse on adult literacy.

There has been a tone of despair in some quarters in respect of the actualisation of the potentials offered through the paradigms of the ideological as against autonomous views of literacy (Street, 1984, 1995, & 2003) and the notion of multiliteracies (Barton and Hamilton, 2000; Cope and Kalantzis, 2009) in a practical sense. Much of the engagement with this framework is considered as an exercise in intellectualism (Colin & Blot, 2003) with even some of the leading proponents of the social/ideological perspectives of literacy acknowledging the potential lack of fulfilment of the potentials offered by these perceptions of literacy (Author, 2014). Street (2006) epitomised this when he asked the question 'what next'? Cope and Kalantzis' strident note of despair is echoed in their acceptance that, "we have not been doing much in a practical sense" (2009, p. 182). Colins and Blot concluded

that the preoccupation of outputs such as the ones from NLG with a multiplicity of models is flawed in that, while it has more general intellectual value, "it is insufficient for re-thinking inherited values" (2003, p. 7). Author's (2014) frustration is echoed in the seemingly rhetoric question "why is the dominant so dominant?" (p. 13).

A conclusion we might draw from these interventions is that the paradigm generated by the recognition of different models and perceptions of literacy appears to have stalled at the altar of what Colins and Blot (2003) classified as mere intellectualisation. Pertinent questions in this context include; how are teachers of literacy expected to utilise in practical terms the principles underpinning these perceptions? What pedagogical template is in place to serve as a guide for teachers of adult literacy in their practice? Essentially, it would seem that while there have been profound theoretical postulations with regards to the arguments of the NLG and others about the viability of a multiple perception of literacy, there has been little advancement in practicalising the embedded principles. A crucial question then is why is this the case?

We make three related arguments in this context. First, we argue that there is an inadvertent innuendo in the intellectual arguments around this viewpoint which suggests that such perceptions must be independent and must be a one-way instrument. We argue further that the notion of multiplicity merely offers practitioners with alternatives. In this regard, alternative perceptions of literacy, we suggest, also offer alternative literacy learning spaces. Finally, we suggest that the most fruitful way for implementing the principles embedded in the arguments of the NLG is to see the various models and perceptions of literacy and their attendant alternative learning spaces as complementary rather than mutually exclusive.

From this background, this paper sets out to achieve three distinct but inter-related goals. First, drawing on sociological and educational theories, it aims to provide an argument for the recognition of complementary alternative literacy learning spaces (CALLS). In so doing, we define and map out the boundaries of CALLS. Second, the paper draws on the findings of a small-scale project to provide empirical evidence on the effectiveness of using the CALLS approach in the teaching of ESOL literacy. Finally, the paper draws from the implementation of the project to explore potential elements of a framework for the pedagogy of CALLS. In essence, this paper aims to travel across the divide, thus reaching out from intellectualisation to actualisation through practice and concluding on a theoretical platform offered by the pedagogical framework to be proposed.

Complementary alternative literacy learning spaces (CALLS): making the case

Much of the traditional conceptualisation of the term learning space is limited to the notion of a bounded physical space often labelled as the classroom. However, in the last two decades, there has been a shift, both surreptitious and overt in this perception. While the main driver has been the advent of the Worldwide Web, the full manifestation has gone beyond just the virtual world of the computer in terms of location. Indeed, outputs and resources have also been transformed to include products such as digital artefacts. Such a shift has led Oblinger (2006) to note that "Learning Spaces focus on how learner expectations influence such spaces, the principles and activities that facilitate learning, and the role of technology" (p. 1). In other words, the traditional conventional and defined concept of learning space as an imposed physical edifice which draws on a prescribed set of resources and ways of teaching has given way to a more flexible, sometimes undefined set of products, processes and settings.

Socio-educational theorists have recognised the shifting landscape of learning spaces. Deleuze and Guattari (1988) offered the twin options of a choice between 'smooth and striated' learning spaces: While striated spaces emphasise a form of vertical trajectory from one point to another, the smooth learning space is more concerned about arriving at a particular destination. In essence, the latter admits all forms of input and structure as long as it leads to the ultimate goal or destination. The smooth, therefore, is less prescriptive than the striated. They concluded that "In a striated space, lines and trajectories tend to be subordinated to points: one goes from one point to another. In the smooth it is the opposite: the points are subordinated to the trajectory" (p. 478).

Striated learning spaces are often described as 'organised' and structured and involve course attendance, lecture theatres, and classrooms, books, learning objects and located within an institution. Smooth learning spaces can, therefore, be described as "open, flexible, contested" (Savin-Baden, 2008, p. 13) and as noted by Deleuze and Guattari, (1988, p. 500), though not in themselves liberating, "they facilitate change or displacement thus enabling life to reconstitute its stakes, confront new obstacles, invent new paces and switch adversaries". This, for us, means that smooth learning spaces can countenance unorthodoxy and are not bound by conventions. More importantly, they recognise multiplicity, same as the concept of multiliteracies and acknowledge the fact that there are more ways of doing things than one.

Perhaps most important for this work is the recognition that smooth and striated spaces can exist side by side, sometimes invading one another, emerging from each other and most importantly, complementing each other. It is from this framework of co-existence that our concept of CALLS emerge. We argue that the notion of smooth learning spaces

legitimises the notion of alternative literacy learning spaces and from this multiplicity of alternative spaces, a complementary relationship can emerge. This is what we advocate in this paper.

In the context of literacy, a case can be made for this pattern of co-existence and multiplicity. In order to make this case, we shall draw from three existing studies. At the heart of what we have labelled CALLS is the argument that if we accept that there are multiple perceptions and therefore, practices of literacy, it follows that there will be multiple spaces in which these different literacy practices are and can be developed. Further, these spaces are not necessarily mutually exclusive. Rather, they can exist in a complementary relationship. As such, literacy development can draw on a combination of these spaces at any given time.

Within the discourse on adult literacy and its practice, perhaps one unassailable consensus agreed by all remains the acknowledgement of multiplicity. In their maiden engagement with the now very popular notion of multiliteracies, NLG anchored their recognition of the diversity and multiplicity of literacy to their desire to "account for the context of our culturally and linguistically diverse and increasingly globalised societies, for the multifarious cultures that interrelate and the plurality of texts that circulate" (Cazden, Cope, Fairclough, Gee et al, 1996, p. 61). They further acknowledged a dimension to literacy which should account for the burgeoning variety of text forms associated with information and multimedia technologies' (p61). At the heart of their argument is "meaning-making" which is to be conceived as dynamic and which bestrides the reality of the social world,. It thus "captures "a range of contemporary literacy forms in the fullness of its multimodal

nature, such that all modes including linguistic, visual, audio, gestural and spatial are recognised and acknowledged in literacy use and development" (Cope and Kalantzis, 2009, p. 166). The rather obvious essence of this foundation, in our view, is that literacy will come in many forms and will be manifested in many different modes. For us, these modes represent different learning spaces and therefore, align with the concept of smooth learning spaces. We suggest that each form of literacy will have an affinity to particular modes and that each mode will further project the literacy associated with it.

The concept of literacy as a social practice (Street, 1996; Gee, 1991) offers a similar framework. In presenting the concept of literacy as a social practice, Street (2012) invited us to recognise " multiple literacies', varying according to time and space" (p. 27). The essence of Street's intervention, as has been laid out in previous studies (1984 & 1995), is that the construct of literacy cannot, and should not be limited to its cognitive manifestations. Rather, it must also acknowledge the various other forms which are "embedded in socially constructed epistemological principles" (2012, p. 29). In other words, the learning spaces within which literacy can thrive cannot be striated. Therefore, we suggest that Street's various social and cognitive forms of literacies must each have an affinity to specific outlets. These outlets again represent what we classify as learning spaces. As such, we argue that each literacy type and form will have specific learning space in which it thrives.

A third strand to which we link our concept of CALLS is the work of Easton/UNESCO (2014) on sustaining literacy. Most relevant is the identification of what Easton terms the literacy environment. A literacy environment for him represents the "factors that encourage literacy learning" (pp. 35–36; Rogers, 2016, p. 1). Decrying the dominance of what he terms supply literacy, Easton invites us to tap into other literacy environments. To do

this, we must recognise and acknowledge the existence of these alternative literacy learning spaces and environments, and must, therefore, tap into the concept of smooth learning spaces.

Drawing from these concepts and frameworks, we offer the concept of alternative literacy learning spaces as the various avenues through which different literacy practices and forms can be presented and in which they thrive. Further, the concept of complementarity emerges from the recognition that the relationship amongst these learning spaces is not mutually exclusive and as is the case with smooth and striated learning spaces, they can co-exist and complement each other. Our goals in this paper are; to demonstrate that this complementary interaction can work and to offer some guidelines on how to effectively utilise the opportunity provided through this co-existence by attempting to identify a pedagogical framework for its use.

Pedagogies of multiliteracies: Current state of play

Since the introduction of the concept of multiliteracies (Cazden et al, 1996; Cope & Kalantzis, 2005, 2009), the overall consensus has been that not a lot has been achieved in terms of a definitive pedagogy for the multiliteracies approach. Cope and Kalantzis (2009) described their original intervention as "a programmatic manifesto" (p. 165), and in their assessment of the progress made so far on the 'how' of multiliteracies pedagogy, they note,

> What have we been doing differently in literacy teaching in recent years? One kind of answer is, depressingly, not much. There is a deadening institutional inertia in schools and their disciplines, in the heritage physical architecture of school buildings and the institutional architecture of educational bureaucracy (p. 183).

Nonetheless, there is some evidence that there has been some progress in utilising the principles of multiliteracies in two specific ways. First, and perhaps more fundamental, there has been an excursion into the realm of carving out a pedagogy. At the heart of this are the original work of the NLG epitomised in Cadzen et al (1996), Kalantzis and Cope (2005) and Cope and Kalantzis (2009). What these studies have done is to provide a conceptual framework for the evolution of a pedagogy for multiliteracies. In this context, key arguments are offered around "what, why and how" (Cope & Kalantzis, 2009; Cadzen et al., 1996; Kalantziz & Cope, 2005). Justification for the why of a pedagogy of multiliteracies is anchored to patent changes in the realm of our existence which includes "our working lives, our public lives (citizenship) and our private lives (lifeworld)" (Cadzen et al, 1996, p. 65). The "what" is justified on the basis of the need to design and redesign to reflect the why, while the "how" is based on the argument that 'human knowledge is initially developed not as "general and abstract, but as embedded in social, cultural and material contexts" (p. 82).

Developing from these justifications, four dimensions of pedagogy were identified and now serve as the conceptual foundation for a pedagogy of multiliteracies. These are situated practice, overt instruction, critical framing and transformed practice. Cope and kalantzis (2009) took this a step further, arguing that the structures and drivers which underpin the emergence of the concept of multiliteracies and its fledgeling pedagogy have remained consistent and have indeed become more obvious. In place of the original four dimensions cited above, they offer a new set of terms which they argue, might be more functional. As such, the original dimensions of situated practice, overt instruction, critical framing and transformed practice, they suggest, should be transformed to "experiencing, conceptualising, analysing and applying" (Kalantzis & Cope, 2005; Cope & Kalantzis, 2009, p. 185). We concur with the authors that the latter set of terms are of the nature that

practitioners can more readily associate with and reduces the abstract ambience associated with the former.

In spite of interventions and reformulations such as the one cited above, we argue that in the context of practice, these concepts and dimensions remain rooted to the realm of intellectualisation and, therefore, not readily accessible to many practitioners. In more specific terms, we argue that these concepts simply do not provide a sufficient degree of 'overt instruction' for practitioners. Cope and Kalantzis (2009) acknowledged this point when they note,

> These pedagogical orientations or knowledge processes are not a pedagogy in the singular or a sequence to be followed. Rather, they are a map of the range of pedagogical moves that may prompt teachers to extend their pedagogical repertoires (p. 186).

In essence, these are mere pointers that could be seen as speculative by some practitioners.

Some studies, however, have extended these concepts to specific settings showing how they have manifested in practice. For example, O'Rouke (2005) used the concepts to illustrate what he calls 'multiliteracies in action'. Mills (2006) drew on them to demonstrate how multiliteracies and multiple meaning-making designs can be made accessible in classrooms. Similarly, Bull and Antsey, (2010) demonstrated how the concepts have been utilised in the design of a project, while Giampapa (2010), using the example of a Toronto classroom, builds on the dimensions offered above to offer illustrations of these concepts in more functional and specific ways.

In spite of these experimentations and illustrations, we suggest that neither of these two forms of engagement has sufficiently advanced the practicalities of a pedagogy of multiliteracies. Indeed, we suggest that while one is by far too general, the other approach is by far too specific. In essence, though consistent, these engagements are not sufficient. As a prelude to what we hope to offer in this paper, we argue that what is required is a framework, which draws on the original concepts while at the same time has the flexibility to be adopted in various settings. What is required, therefore, is a framework that is sufficiently pliable, so that, while it can give an account of a specific situation, it can also be used to interrogate and analyse different real-life settings.

Complementary Literacy Learning Spaces (CALLS) in Practice

In this project, we employed a computational learning space, Scratch, as a complement to the conventional classroom ESOL and literacy teaching and learning environment. We investigated the impact of using this learning space within a complementary framework on the learning of young ESOL students in a further education college in the United Kingdom. Scratch is a new open-source computer programming and authoring environment, which was launched in spring 2007 by the Massachusetts Institute of Technology Media Laboratory. It employs new digital media and visually programmable objects provided through visual programming and authoring environments. In addition, it enables learners to construct computational code blocks and experiment with computational thinking through the creation of meaningful artefacts and creative expressions including digital storytelling, games, interactive art and animation. Scratch has been increasingly seen as a tool which symbolises a computational culture and facilitates the development of computational thinking skills (Brennan & Resnick,

2012). Scratch was, therefore, used to provide our learners with an additional learning space that relates to their ESOL curriculum. Scratch was considered a viable tool because it relies more on constructive use of new media rather than the technical abilities of computer programming and coding. As such, participants only require a basic level of comprehension and engagement with computational processes.

The Process

In a fieldwork stretching over ten weeks, the project involved twelve full-time students in a mainstream level 1 ESOL class in a college in London (See the description of different levels in the UK national qualification framework in the appendix). This served as our experimental group while their non-participating classmates served as the control group. The participants, who studied ESOL in one-hour sessions twice a week, confirmed their willingness to engage with the Scratch authoring programme through a pre-study questionnaire (Farrell & Lim, 2005; Ragin & Becker, 1992). We further scrutinised the volunteers to ensure that only participants who had not previously used Scratch were included in the study. At the onset, we introduced all the participants and their teachers to the workings of scratch.

Experimental group participants engaged with Scratch in the second half of their classes through a parallel co-teaching approach (Rytivaara & Kershner, 2012) while the control group students continued their normal classroom activities. The participants were then tracked individually and as a group through observations and follow-up focus group interviews in order to measure their progress.

Our focus was rather limited, as we identified two areas from the scheme of work for the class in conjunction with the learners. These were spelling development and vocabulary development and comprehension. All the Scratch projects used in the study were, therefore, related to these two areas of the curriculum. At the beginning of the study, each participant was invited to identify a topic from the scheme of work for the class that they would be most interested in improving. This essentially involved a process of negotiation which required the participants to justify their choice and to locate it in the context of their conventional classroom programmes. Following this, participants were taken through a number of options available through Scratch in terms of either existing or newly created projects. What was central was that their choice of projects was directly linked to their class programmes. We draw on some of these projects to illustrate our findings.

Research methods

This project was designed as a case study and employed a range of data collection methods including questionnaires, field notes from observed classes, interviews, and analysis of produced digital artefacts. The design aimed to test out our proposition regarding complementarity, thereby establishing a logical link between our data and proposition using each project that our participants engaged with as a case study (Yin, 2009). In this context, therefore, the study is rooted in the proposition that alternative literacy learning spaces such as Scratch could complement learning achieved through the conventional classroom learning space. To validate this proposition, we set out to measure the achievement of learning goals in the two specific curriculum areas by both the experimental and control groups to see if there are differences in their levels of achievement using a cross-case analytic technique (Yin, 2009). This allowed us to compare and contrast the multiple case studies in the study.

Underpinning this study are three theoretical propositions built around a multiplicity of literacies, complementarity of literacy learning spaces and the computational space as manifested in Scratch. These propositions were the anchor for our analyses of the case studies. Our analyses draw on two models; computational thinking (Brennan & Resnick, 2012) and multimodal literacy (Jewitt, 2008; Kress, 2000). What we present as findings are observed evidence of progress made by participants in the experimental group when compared with their counterparts in the control group.

Evidence of significant progress in spelling

We observed significant progress in the spelling skills of participants in the experimental group. The progress we observed was partly demonstrated through the experimental group's engagement with a remixed Scratch project, "Spelling Game" (Figure 1a). Remixing is a functionality that enables online users to import a project from another member in the Scratch online community, building upon or customising others' Scratch projects and sharing them again through the Scratch online community. Our measurement was based on two elements. First, we looked at the achievement of our control group in the required spelling component of their curriculum as reflected in their Scheme of Work which had a learning outcome that requires learners to be able to spell a list of twenty words presented in Table 1. After seven weeks of tuition, we began to record the performances of our participants. We allowed for this period to ensure that our participants have consolidated their learning following tuition.

We found that all the students in the experimental group were able to correctly spell between eighteen and twenty words in the list consistently. In contrast, students in the control

group were able to spell between eight and twelve words correctly. There was, therefore, a significant difference in the achievement of spelling goals between the two groups. This is even more significant because we limited the engagement of the experimental group with Scratch to the class sessions. As such, there was no obvious possibility that the better achievement of the experimental group was informed by the fact that they spent more time studying.

We explored the driver for this improvement from participants at interview. GFL1 (17-year-old female student), who had frequent spelling flaws prior to her engagement with Scratch, but who now consistently spelled all the words in the list correctly said, "I feel using Scratch with spelling [grammars] because I got [a] problem with that, and also recording my voice to see, like, my reading". When asked to describe how Scratch has helped her develop her spelling skills, she noted:

> Yeah [student thinking], if I was going to spell 'ambiguous', I will probably will miss, like, I don't know, some letters and just got it wrong. Then I think the programme actually help me to see "how is the writing". Because, you know, the game has little lines to see how many letters as I go [in the spelling of the word]. So, this tell[s] me how many amounts of it [number of letters in the word] like how long it is [the word]. You know sometimes I added some extra [letter] "O", "U", "O", "E" at the end, but it did not meant to be there. (GFL1)

We explored this with another student in the experimental group, SFL1 (18-year-old female student), who commented:

> It actually helped me a lot in my speaking to do my project and to talk, and to say what I want to say as well …and it helped in my writing as well. My writing

> is bad, and it actually helped me….when I start using it, it is actually helpful in term reading and writing. You have a lot of vocabulary, and you remember it. (SFL1).

When asked for specific examples, she responded:

> For example, if you say 'marvellous', what does this mean? And so you have to create words with Scratch…so it help[s] you remember the word. So it actually helping me to remember the word. So it helped me in remembering as well (SFL1).

The comments above show how Scratch has functioned as a framework through which these learners were able to enhance their learning in a complementary relationship with their class work. The two comments above bring into focus the conceptual foundation for a pedagogy of multiliteracies (Kalantzis & Cope, 2005; Cope & Kalantzis, 2009), as they offer evidence of experiencing, conceptualising, analysing and applying on the part of the students.

Second, we mapped the further gains of participants in the experimental group through the digital artefacts they generated from the project. As illustrated in Figures 1a, 1b and 1c, students in the experimental group had not only mastered the spelling of the words in the list; they had successfully discovered new multi-syllabic and relevant words and mastered the spelling of these words. The attribute of the Scratch project that might have facilitated this project is the opportunity it offers for discovering and using new words. This promotes a sense of autonomous and discovery learning (Benson & Voller, 2014) which ultimately contributes to learning. On the whole, participants in this group had identified over ten

additional words which their counterparts in the control group had not identified. In effect, apart from the improvement in spelling that the participants had demonstrated, they also provided evidence of the expansion of their vocabulary base.

Developing vocabulary and comprehension through Greek and Latin roots of English words

Our findings were based on evidence from our participants' engagement with another set of Scratch projects which realtes to the curriculum requirement for developing the vocabulary and comprehension of students. The goal of these projects was to help develop learners' vocabulary through the use of roots of English words, particularly Greek and Latin roots (See Figures 2a, 2b, 3a and 3b). A list of 12 common Greek and Latin roots were identified and distributed to all participants (experimental and control) as part of their classroom exercise. While the experimental group used Scratch to interact with these roots, the control group engaged with them as part of their classroom exercise. Each of these roots is illustrated by 2-3 common English words which the students were required to master.

Our findings show that the students in the experimental group were able to learn more English words derived from the 12 Greek and Latin roots than their counterparts. Members of both groups were tested for enhancement in their vocabulary at the end their 8^{th} week of tuition. While participants in the experimental group recalled and demonstrated their comprehension of the uses of an average of 22 words out of the 30 words derived from the Greek and Latin roots, participants in the control group averaged 14 words (See Tables 2 & 3).

Beyond recall and comprehension, there was an additional dimension to the achievement demonstrated by participants in the experimental group. This involved a remixing process which led to identifying additional Latin and Greek roots of English words, as well as recording English words and sentences that were derived from each added root. For example, one participant, KME2 (17-year-old male ESOL student) remixed the project and added new Greek word roots and the English descriptions of these roots, and recorded the pronunciation of the roots and the examples of English words that can be formed from them (See Figures 3a and 3b in which new roots ‘man’ and ‘log’ were identified).

We explored this further at an interview with this student, who commented that learning additional common roots of English word such as ‘log’ and ‘auto’ led him to understand the meaning of ‘manual’, ‘logic’ and ‘logbook’. Similarly, SFL1 explained how the discovery of new word roots led to the learning of some new words (See Figure 4 and Table 3 as illustrations of the progress made by these students).

SFL1 reported during an interview that using Scratch projects based on English word roots enhanced her English vocabulary and spelling. We asked her about the ways in which she thought Scratch projects had facilitated this progress. She illustrated:

> Say for example, if you said a ‘tele’, which mean different meaning, but if you get the ‘tele’, which is T.E.L.E, you can get ‘telephone’, how you remember what the voice mean. You can actually read as well. Scratch how good it is, make people can read, I remember (SFL1).

Tutor's views

We discussed the progress we observed with the students' regular classroom tutor. We, presented our field notes together with the artefacts produced. The tutor acknowledged the progress made by students in the experimental group and the role of the word roots and spelling Scratch projects in particular:

> I think it's very useful for them to be able to access different techniques, techniques on knowledge, so looking at the roots of words and different word endings, that kind of grammatical and vocabulary thing is an interesting way which they probably don't get otherwise in functional skills English courses or qualifications, because it's kind of going behind the scenes to look at sorts of linguistic roots of English and it gives them new tools to use in their spelling and writing (The ESOL Tutor).

Although limited in terms of the number of students involved and the duration of our experimentation, there is an indication that participants in the experimental group had made more progress towards achieving their curriculum goals when compared with their counterparts in the control group.

Attitudinal Gains

We explored from our participants in the experimental group whether there were additional gains that they had registered through their engagement with the Scratch projects. One area that the participants were unanimous about in terms of further gain was in their

confidence. In our interview, participants reflected on how Scratch had contributed to improving their confidence. One participant, GFL1 noted that Scratch projects helped

> in terms of write what you need, if you wanna write something in new way, in terms of, if you wanna build your confidence when you speak and you record your voice. And there is many ways as well, there is a lot of different terms (GFL1).

We note that the spelling Scratch projects offer users the opportunity to record their pronunciation of newly discovered words. Because the programme confirms the accuracy of pronunciation and spelling, it is probable that this could have resulted in reassurance and validation of learning. .

Even more insightful was the revelation that participants in the experimental group engaged more with their homework following the project. According to the participants' tutor, these students traditionally engaged minimally with their homework prior to the study. However, following their ten-week engagement with Scratch, the tutor noted that participants in the experimental group now work at home using the Scratch tool. The ESOL tutor explained that because the participants were enrolled on other main courses with substantial coursework and assignments, they "never really wanted to do [ESOL] homework at all". However, following the Scratch project, the students

> don't see working on Scratch as homework because it is not just filling in a worksheet or writing an essay, but it is actually interactive, it is on the computer, so I think that would be an excellent way of engaging them to take an interest and make efforts in their own time (ESOL tutor, personal communication, 11 June, 2015).

The evidence we have explored here is admittedly limited. However, what it has offered is a chance to explore the potential of complementarity. The Scratch projects explored in this study can be seen as feeding into the three ESOL learning strategies of the visual, the contextual and the phonic (Steeds, 2001). Based on this relatedness and indeed what might be seen as locatedness in the academic curriculum context, it is viable to argue for complementary use of different learning spaces in the teaching and learning of ESOL and literacy. This echoes the perspectives of new literacy studies (Cope & Kalantzis, 2009) that embrace multiple and multimodal literacies and discourses (Jewitt, 2008; Gee, 2001), and reinforces the principles of CALLS which we set out to promote in this paper. The use of Scratch as an alternative learning space in this study shows that there are multiple media for literacies and that they can co-exist within a complementary framework. In other words, these projects introduce a computational dimension to the sociocultural view of literacy such that literacy practices and meaning-making can be understood within multiple contexts of representations (Lankshear & Knobel, 2006). This project, therefore, provides a functional modality for engaging with the challenges of using digital and computational technologies as part of the sociocultural literacy approach in an ESOL classroom.

CONCLUSIONS

Our goals in this paper are threefold. First, to provide an argument for the recognition of complementary alternative literacy learning spaces (CALLS), while offering a definition and mapping out its boundaries. Second, to provide empirical evidence of the effectiveness of using the CALLS approach in the teaching of ESOL literacy, and third, to offer a framework for the pedagogy of CALLS.

We have attempted to answer the first two research questions. In defining the boundaries of CALLS, we have drawn on a range of sociological and literacy theories to rationalise the need for the consideration of CALLS as a way of facilitating literacy learning. At the heart of this is the recognition of the notion of multi-literacies and its attendant notion of multi-modality. Further, we have been able to show, though in a minimal sense, that there is potentially, significant values to be gained from using the CALLS approach in literacy and ESOL classrooms in a complementary relationship.

More important, however, is the third goal of this study. Is there a pedagogy of CALLS? Has that pedagogy emerged from this study? Like other studies preceding this one, there are no definitive answers to this question (yet). What was clear from this study was that CALLS is a viable option for operationalising the notion of multi-literacies in classroom practice. Based on the small study reported here, we can offer a number of elements as components of an effective pedagogy. Interestingly, these elements converge with components of effective multi-literacy pedagogy offered for instance in Cope and Kalanzis (2005, 2009), O'Rouke (2005), Mills (2006), Bull and Antsey, (2010) and Giampapa (2010).

Four elements emerged as desirable components of an effective CALLS pedagogy. These are the elements of choice and option, autonomy to a certain degree for learners, the opportunity for self-reflection, and corroboration and affirmation of learning through sharing. We have identified these elements on the basis of the structure and implementation of the current study. For example, it was obvious that the opportunity to pick their own preferred projects was instrumental to our participants' engagement and is reflective of the learner autonomy that is advocated in the debate around the recognition of multi-literacies (See

Author & xxx, 2015; Giampapa, 2010). The same is true of the opportunity to self-reflect and to validate learning that the structure provides. In our view, over and above these, the ultimate achievement is the provision of the avenue to transfer learning and achievement across learning spaces and media. It is that opportunity for the transference of learning across spaces that sits at the heart of CALLS and recommends it as a viable framework for operationalising the principles underpinning multiliteracies in practice.

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Appendices

Appendix 1: Project 1Scratch 'Spelling Game'

The 'Spelling Game' Scratch project (Figure 1a) is built around a list of English words that are pronounced one at a time. The project user is then invited to try to type the correct spelling of the word s/he has heard. The project provides hints about the number of characters in the word and reveals selected characters. Consequently, the user hears the pronunciation of the word followed by a sentence that explains the word. For example, the word in focus in Figure 1a is "suggested". The user hears the following utterance: "Suggested. Eric suggested that Jane gets a new car". The user is then invited to type the correct spelling of the word in the text box provided. For a complete list of words, see Table 1 below.

Figure 1a: an illustration of SFL1's remixed Scratch project on the spelling of English words - a vocabulary drill and a gap-filling project.

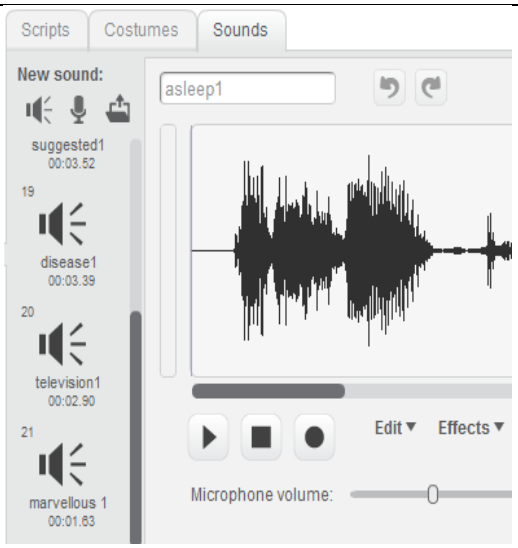
Appendix 2: Table 1: words and sentences in the Scratch project entitled "Spelling Game" by a Scratch user called "srearley".

#	English word	Example heard
1	Keeping	Jane is keeping her old car.
2	Feature	Jim outstanding feature is his long crochet nose.
3	Queen	England is ruled by a queen.
4	Method	The scientific method is very useful.
5	Asleep	She dreamed while she was asleep.
6	Spelling	Your spelling needs improvement.
7	Empty	The treasure chest was empty.
8	Television	Eric lost his television remote.

9	Elevator	There is nothing worse than elevator music.
10	Agree	They both agree to behave
11	Beneath	The mammoth is barred beneath the ice
12	Metal	Jane likes heavy metal music.
13	Disease	We should always try to prevent disease.
14	Tea	Would you like a cup of tea?
15	Feelings	He called her a name and hurt her feelings
16	Coffee	Without coffee the world will surely end.
17	Suggested	Eric suggested that Jane get a new car.
18	Deal	That price is a great deal.
19	East	The opposite direction from West is East.
20	Needed	All he needed was a nap.

Appendix 3: Figure 1b: a snapshot of the list of words in the spelling project in which the student can add as many new words as she wants.

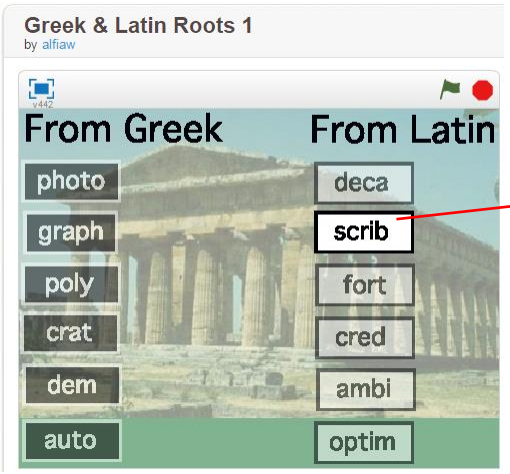
Figure 1c: a snapshot of the sound functions of Scratch, and a list of recordings for the pronunciation of words in Figure 1b.



Appendix 4: Project 2: Greek and Latin roots of English words Scratch projects

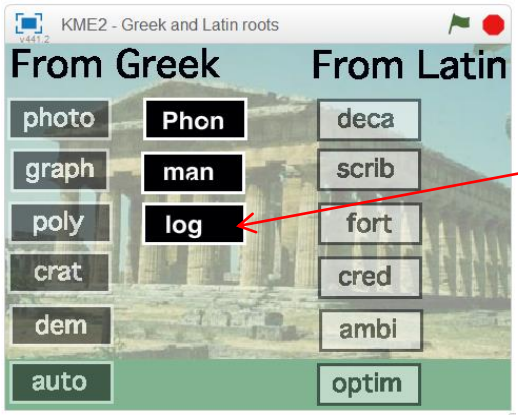
This project includes examples of Scratch projects that were designed with the goal of developing the English vocabulary of students in mind. The strategy was to help develop the learners' vocabulary through the use of roots of English words, particularly the Greek and Latin ones. KME2 found the English word roots, particularly the Greek and Latin ones, a stimulating activity for increasing his English vocabulary.

KME2 used a Scratch project entitled "Greek & Latin Roots 1" by a Scratch user called "alfiaw". This project provides about a dozen Greek and Latin roots of English words as illustrated in Figure 2a. When a user clicks on any of these roots, the English meaning of the roots is pronounced and displayed on the screen. Figure 2b shows a snapshot of when a user selects the Latin root "scrib". The user listens to the pronunciation, and to the meaning of this root form in Latin: "Scrib means to write in Latin". The user also sees the English meaning of the root on the screen, side by side with a descriptive photo of the root.

Appendix 5: Figure 2a: a snapshot of the Greek and Latin roots Scratch project.	Appendix 6: Figure 2b: a snapshot demonstrating the result of a selection of a root "scrib"
	

Similarly, SFL1 also engaged with and used the Scratch project entitled "Root Word Project" by a Scratch user called "JNLASCRATCH". In this project, SFL1 explored and learned some new word roots, which assisted her in increasing her vocabulary and improving her writing. The project provides a visual illustration of English word roots as well as examples of each. Figure x shows a snapshot of this project, with illustrated examples of the word root "loc", as in the words "location", "lockers" and "local". In this project, SFL1 not only learned some new words but also learned how to identify a variety of English words by decoding their roots, for example, through learning about Greek and Latin roots as discussed in following section.

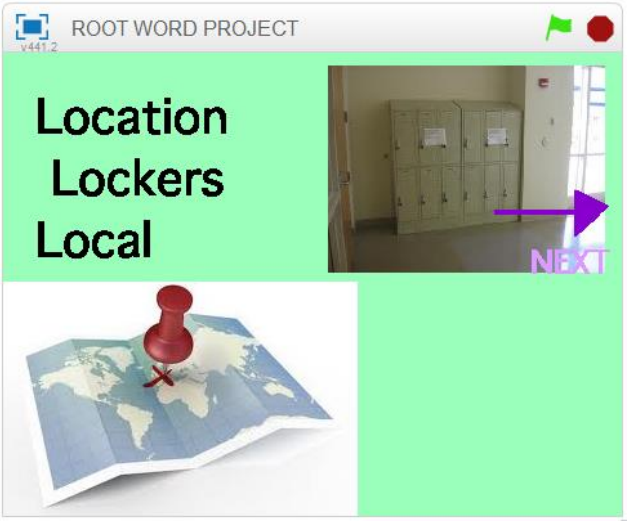
Appendix 7: Figure 3a: a snapshot of the remixed Greek and Latin roots Scratch project.	Appendix 8: Figure 3b: a snapshot of a remixed Scratch script of the added root “log”.



Appendix 9: Table 2: a list of the words reviewed in the Greek and Latin roots Scratch project

#	Root	Meaning	English Words derived from this root that the learner has reviewed
1	photo	light	photograph, photon
2	graph	picture	Photograph, graphic
3	poly	many	polygon, polygamy
4	craft	power	aircraft, spacecraft
5	auto	self	automatic, autopilot
6	dem	people	demography, democracy
7	deca	ten	Decade
8	scrib	write	Script
9	fort	strong	Effort
10	cred	believe	credit, creditable
11	ambi	around, about, both	ambiguity,
12	optim	best	optimal

Appendix 10: Figure 4: a snapshot of the English word roots Scratch project used by SFL1. Project demonstrate the root 'Loc' as in the word'location'.



Appendix 11: Table 3: a summary of the English word roots, their meaning and the examples provided for each root in the Scratch project entitled "Root Word Project" used by SFL1.

word root	Meaning	Examples provided
aqua	water	aquatic, aquarium, aqueduct
gen	generation	generation, general, gender
bio	life	biography, biology
spec	to see or look	spectators, specialist
sign	an object, quality or event	signature, signed, sign language
loc	place	location, lockers, local
mater	having to do with motherhood	material, maternal
cog	to know, to learn	cognition, cognizant
photo	image or picture	photography, photogram, photosynthesis
aud	sound	audition, audio, audi
cap	to take, seize control	captain, capture, capable

Appendix 12: The UK national qualification framework. Page 1 of 1.

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<tr><td></td><td></td><td>Key skills
Level 5</td><td>National
qualifications
framework
Level 5</td></tr>
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Level 4</td><td>National
qualifications
framework
Level 4</td></tr>
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Level 3</td><td>National
qualifications
framework Level 3
(e.g. A level)</td></tr>
<tr><td></td><td>Literacy/Numeracy
Level 2</td><td>Key skills
Level 2</td><td>National
qualifications
framework Level 2
(e.g. GCSE A*–C)</td></tr>
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Curriculum
Level 5</td><td rowspan="2">Literacy/Numeracy
Level 1</td><td rowspan="2">Key skills
Level 1</td><td rowspan="2">National
qualifications
framework Level 1
(e.g. NVQ level)</td></tr>
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Curriculum
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Level 2</td><td>Literacy/Numeracy
Entry 2</td></tr>
<tr><td>National
Curriculum
Level 1</td><td>Literacy/Numeracy
Entry 1</td></tr>
</table>

Source: Adult Core Curriculum (Steeds, 2001, p4)

7,765 words