Not just how but why: EAL and ICT in the multilingual classroom

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Many years ago I was working with a mainstream teacher in a primary school who said to me at our first meeting 'You can use the computer with your pupils anytime you like. It's really good for them'. To show willing I investigated the BBC machine just in front of the paint pots and glue sticks. It had an alternative paper keyboard which was now peeling off and took a while to power up. Once I had got it going, I found out I could add bricks to a wall to keep a dragon out or use the arrow keys to locate hidden treasure. Much to the chagrin of my colleague, I never did get around to using it in my teaching. I could have done, but why would I when instead we could be talking, creating text and sharing ideas about ancient worlds, the solar system or the communities where we lived.

But technology and its availability in the classroom have changed. Once ICT was a special interest. Now few official documents or reports on education are complete without reference to the use of ICT in teaching and learning. The single BBC computer has been replaced by interactive whiteboards, tablet PCs and digital cameras. Developers are beginning to consider tools, applications and content specifically designed for EAL and bilingual learners. In our field, ICT has moved from a special interest to a special unease. This unease is sometimes expressed as 'Am I doing *enough* ICT? sometimes as 'Am I using ICT in the *right* way?' and sometimes as 'Why isn't there *more ICT* for EAL and bilingual learners?' Concerningly, developments in new educational technology sometimes appear to be conceptualised by those outside the field as offering a solution to the 'problem' of EAL and bilingual learners in the mainstream context. A bit like my colleague and her ideas for *my* pupils.

It is a feature of the rapid expansion of ICT in education that many innovatory tools, techniques and experiences are adopted, used or experienced and then considered in terms of pedagogy. However ICT is not now new and EAL teachers have had a chance to use and reflect on its use in the distinctive situation in which EAL learners find themselves. UK research suggests that ICT has the most positive effect on teaching and learning where it is targeted at specific areas of learning, with a clear rationale for its use from a broad research base about ICT, about pedagogy and about professional development. In this article I hope to contribute to this by revisiting the five pedagogical principles in NALDIC Working Paper 5 and asking what we can learn from the development of computer assisted language learning (CALL) and research on using ICT in schools to inform how we use ICT to support these principles. I also ask whether new principles or approaches are needed to reflect the changing learning environment and its attendant new learnings and literacies.

For the purposes of this article, the discussion concerns EAL rather than bilingual education. As Stephen Krashen pointed out at a NALDIC conference last year, the essentials of good bilingual programmes are subject matter teaching in L1 without translation, literacy development in the first language and comprehensible instruction in English. Through virtual classrooms, for example, L1 subject matter teaching and L1 literacy development are perfectly possible for all pupils. In fact, ICT can allow for multilingual medium education within an English medium schooling system. Whilst this is acknowledged, the focus here is on the EAL learning of students in mainstream classrooms. But first, a short history and a few terms.

Warschauer (1996) identifies three distinctive phases in the development of CALL which he refers to as behaviouristic, communicative and integrative. Behaviouristic CALL, first conceived in the 1950's, was characterised by repetitive 'drill' activities in which the computer acted as a *tutor* – a vehicle for delivering instruction and correction to the student. As behaviouristic approaches to learning fell out of favour in the 70's and 80's, this was replaced by a communicative approach. In this phase, the computer was still the

tutor, still knowing all the right answers, but allowing the learner to discover these through exercising a degree of choice and control. Newer skill practice programs provided for supported reading, text reconstruction and language games alongside drills. The computer also began to be used as a *stimulus*, to generate student discussion, writing and critical thinking. Non-language learning specific software like general games and simulations were often used in this way. A third development was the view that computers should be used as a *tool* for language learning, not necessarily providing any language specific activities per se but helping the learner to use or understand language through its functions like word processing, spelling and grammar checking, desk top publishing and concordancing.

As task or project based approaches to language learning gained ground in the 90's communicative CALL was superseded by integrative CALL which aimed to integrate the various aspects of the language learning process. Multimedia (text, graphics, sound, animation and video) technology encouraged the natural integration of speaking, listening, reading and writing in a single activity. The linking of multimedia resources together (or hypermedia) accessed through a single machine, allowed each learner to navigate an individual path through similar content, able to draw on any element of the linked media at any point. At the same time, computer mediated communication (CMC) - email, discussion lists, chat rooms, virtual classrooms, the internet, and websites – removed many of the physical barriers to meaningful and authentic communication.

Warschauer argues that behaviouristic, communicative and integrative CALL are not mutually exclusive. Each new phase gains acceptance slowly and unevenly and '*does not necessarily entail rejecting the programs and methods of the previous stage; rather the old is subsumed with the new*' (1996, p1). In classrooms in the UK, programs and approaches which reflect all three phases of CALL can be observed in work with EAL and bilingual learners (or indeed no programs and approaches at all). This is not just a question of the choice of software or hardware, it also concerns methods and approaches. A drill and skill program can be used as a *stimulus* for a group discussion as easily as an interactive whiteboard can become a rather boring *tutor*.

Approaches to CALL are posited on learner situations which do not wholly reflect the EAL situation in the UK. They are generally based on the assumption that language development is the target even though the language learning is often developed alongside or within a particular discipline or subject area. In contrast, the distinctive position of EAL learners in mainstream classrooms in the UK is often characterised by a focus on subject learning and achievement with language learning as the means of access and language development as an additional aim. However, thinking about behaviouristic, communicative and integrative approaches may be helpful to teachers in identifying how and why they are using ICT to support the pedagogical principles of EAL.

Activating prior knowledge in the pupil

Bilingual pupils' experiences will vary, as will their use of English and knowledge of culturally specific frameworks for learning. Learning involves integrating new information ('input') into their existing mental model of the world (or schema). In second/additional language learning, prior knowledge of content and language plays a major role in helping to make second language input comprehensible.
One of the major tasks for EAL specialists in the classroom is to 'activate' students' prior knowledge. Prior knowledge makes the learning process more efficient, as the more that is already known, the more that is understood and therefore learnt from the input. The activation of this knowledge is key, as pupils may not explicitly realise what they know about a particular subject or way to use language unless this is brought to their consciousness. EAL and bilingual learners' knowledge may be available only in L1 or may be culturally located so that without explicit support and activation, the learner may not make the link. Activating prior knowledge additionally allows teachers to see what they need to provide in terms of concepts and language.

Skill practice programs are often promoted as a means to activate or build prior knowledge to make the learning process more efficient. For example, curriculum content programs are

often used with learners who have limited prior experience of the subject and English skills programs with early stage learners of English. However, these programs are generally based on a different set of assumptions about the learners' prior experience. Curriculum programs are based on the assumption that the learner is an L1 English speaker and has been in UK schools throughout the prior phases of education. English programs are based on the assumption that the learner is either acquiring English as a first language or as a second language but in situations far removed from their reality. It is clear that for many students, the information in curriculum programmes will be linguistically inaccessible. In many others, there will be a cultural gap between what is assumed and actual experience. As Warschauer notes in the CALL context, skill integration is not the same as '*integrating meaningful and authentic communication into all aspects of the language learning curriculum*'. (1996, p5)

The incorporation of multimedia offers enhanced opportunities to activate prior knowledge through the wider variety of forms in which it can present or represent information. The combination of text, pictures, sound, tables, graphs, simulations or models may help provide the link for students between that which is immediately linguistically accessible and that which is cognitively accessible. For example L1 text or commentary can be incorporated as can virtual objects or representations of concepts which can be observed, manipulated and simultaneously described. However multimedia itself can only 'display' the new information and invite participation. Activating or building the connection between the input and the infinitely variable learner still requires mediation by a peer or the teacher. This suggests using multimedia resources or activities as a *stimulus*, the learner becoming conscious of their prior knowledge through meaningful communication with teacher or peers. The point is that the integration of media is used to support meaningful communication.

The use of whiteboard presentational technology to stimulate or activate prior knowledge is well established in many classrooms. Typically the teacher makes a multimedia presentation, and the students discuss and/or interact with this. The technology is used to present the knowledge in a variety of ways and the ensuing discussions/interactions are largely mediated through the teacher. This approach is largely transmissional and does not necessarily allow pupils the opportunity to process the content. Indeed classroom observations often provide evidence that whiteboard technology simply facilitates a more enthusiastic but typical 'IRF' exchange. Perhaps more interestingly, multimedia can be used in small group exploration and discussion. Small group explorations of multimedia resources are likely to provide far greater opportunities for exploratory talk, discussion and negotiation of meaning - Wegerif's I*D*RF – than presentational technology. In this way, teachers can facilitate the activation of prior knowledge by developing meaningful communication around multimedia content and language.

Some people view multimedia programs or presentations as no more than a text book 'come alive', however one of the crucial advantages is that students and teachers now have much more control over the content of the textbook. They can choose what to access, foreground, add, change and insert.[1] As such, they are no longer limited by the linguistic, cultural and physical ethos and resources of the classroom in what they choose to present. They can to some extent challenge cultural and linguistic orthodoxies. This is a key advantage in supporting the connection between the new content and language and EAL pupils' varied language and life experiences.

Computer mediated communication provides similar flexibility in the sharing and activation of prior knowledge and experiences. CMC can be; synchronous or asynchronous; one to one or one to many; through speech (say in MSN messenger or video conferencing) or through writing. CMC allows users to share brief messages and ideas as well as lengthy information, graphics, sound and video. Discussion through video conferencing, the virtual classroom

[1] For a more detailed explanation of programmes and how teachers can adapt these see Sheilagh Crowther's Using ICT to Support EAL Pupils
http://www.becta.org.uk/page_documents/teaching/sen/ealoriginal.pdf

and email or discussion forums can take place anywhere and in any language. With planning, it can take place in real time as part of a taught session or asynchronously in preparation for a session. Hosting the typical EAL 'pre teaching' session in a virtual space could help unravel the current compromise of part teacher led L1 discussion and part L2 'catch up' by clarifying the purpose and selecting participants accordingly. Through CMC the potential participants in the traditional thought storm are relatively limitless, providing a much greater opportunity to validate pupils' experiences and develop understandings. Cummins and Sayers study of email exchanges between diverse groups of learners around the world concluded that such communication allows learners '*to amplify literacy and intellectual skills collaboratively with peers in culturally and geographically distant settings*' (p21) and research quoted by Warschauer (2004) indicates that like talk around computers, CMC moves discussions away from IRF exchanges and promotes the collaborative exchanges essential to the activation of prior knowledge.

The provision of a rich contextual background to make the input comprehensible

Pupils learning EAL require opportunities to draw on additional contextual support to make sense of new information and language. Content learning for pupils learning EAL can be greatly improved through the use of visual support. This can help learners to conceptualise learning tasks that are being presented to them, or in which they are engaged, even when their knowledge of the target language is limited.

The distinctive position of EAL learners in the UK requires them to make sense of and learn language and content from subject based input. Multimedia by its nature provides a rich contextual background through the variety of ways it can present or represent information. The development of hypermedia has led to a great variety of potential supports for meaning (for example L2/L1 text, L2/L1 speech, pictures and videos, tables and graphs). Multimedia also enables the visualisation of lengthy or complex processes and abstract concepts through simulations or models. Research suggests that the observation of these simulations or models can develop conceptual understanding in a way which static representations cannot. This research largely concerns the development of subject concepts, particularly in maths and science. The impact of the visualisation of language concepts and processes has not yet been researched.

For EAL learners, a further advantage of visualisations is that they can vastly reduce the linguistic complexity of the concept being presented whilst at the same time provide support for language outputs concerned with what, why and how. In this way they can scaffold language output from naming language, to observational language to the more academically complex language of explanation, hypothesis, prediction and generalisation. In many cases however, multimedia is under-used to support visualisation and conceptualisation of learning tasks and concepts and falls short of supporting the integration of language and content. In line with Krashen's i+1 theory, input needs not only to be comprehensible but also to model language that goes beyond what learners can produce for themselves. Many approaches to ICT provide help in understanding the linguistic input but do not begin to model language to extend what learners can say and write. The situation of EAL learners means teachers need to use ICT to support and extend subject matter comprehension whilst at the same time modelling and extending the learner use of language.

Working paper 5 discussed the difference between a picture of a frog (visual aid) and a diagram of the life cycle of frog (key visual). It is still necessary to keep this distinction in mind in relation to multimedia technology. Using multimedia a teacher may now combine a picture of a moving frog with 'frog' spoken and written in L2 and L1 and so create a multilingual multimedia aid. Many commercial beginner programmes are developed on this premise. A multimedia flashcard is displayed and the learner names or identifies it in some way. Whilst this approach does present information in additional forms it does not necessarily support the development of conceptual and language knowledge. However if the teacher combines the multimedia images with a classification chart or combines a simulation of the frog developing with a voice over and a flowchart then they are far nearer to using multimedia contextual support to integrate language and content learning.

Subject matter comprehension can be supported through the abstract concepts or process being made visual. Subject understanding can be developed by the learning task. Language development can be achieved through the manipulation and construction or reconstruction of the key visual through text or speech or both.

Reading is a highly significant source of both comprehensible input and language modelling and extension. Repeated research (Krashen) has shown that the development of reading and academic language are strongly related to the amount of target language reading carried out. Yet many pupils experience difficulties with parts of the reading process in ways which both inhibit their language and subject learning from text and discourage them from L2 reading. ICT can support both. ICT can improve motivation to read and time spent reading as the choice of reading via the internet is far wider and provides greater opportunities to reflect learners' interests and linguistic competence. Multimedia literature integrates text, sound and image which provides a richer contextual background to scaffold comprehension (although speech engines sometimes work against this). This integrative use of ICT also allows the learner to control the level of scaffolding depending on purpose and situation. A teacher prepared text in PowerPoint can have an accompanying sound and image files which learners choose whether to access or not. British Council magazine articles allow readers to directly access the meaning of any word as explained in an EAL dictionary simply by clicking. The learner clicks to access an explanation of the part of speech, pronunciation, simplified meaning and exemplification within the sentence. (see http://www.learnenglish.org.uk/) In Jim Cummins e-Lective system this will be combined with clickable access to L1 translations, synonyms, grammatical information related to the word or phrase, idiomatic or useful expressions and English/L1 cognates. This integrative use of ICT allows content or language to be foregrounded or backgrounded depending on the situation and the learning intent. In the first reading of the text (for meaning) the learner may choose to access the L1 equivalents. During the second and subsequent reading, the learner may choose to access support to understand *how* the language is used to present the meaning. A powerful support to learners in demystifying and learning how text works.

Actively encouraging comprehensible output

Learners are actively encouraged to produce spoken and written language from an early stage of the lesson(s) onwards. This is important for both cognitive and linguistic development. The active use of language provides opportunities for learners to be more conscious of their language use, and to process language at a deeper level. It also brings home to both learner and teacher those aspects of language which will require additional attention.

The active use of language to process language at deeper level and to promote language consciousness is key to the learning of EAL. ICT and especially computer based programs are often seen as the ideal way to encourage active language use, sometimes seen as having the added advantage of being 'out of the way' so that the language learning process does not impact negatively on teachers or peers. This has parallels with the development of behaviourist and communicative CALL programs posited on the idea that the computer was an ideal *tutor*. A teacher may be 'too busy' to teach language and curriculum, get bored or boring, create tension for the learner over mistakes, or get so interested in what the learner is saying that they became active participants in the negotiation of meaning and fail to adequately record the aspects of the learner use of language which require additional attention. In contrast the computer as *tutor* is always available and has no boredom threshold so the learner can repeat the activity until she/he rather than the tutor gets fed up. The motivational impact of computer use means that many learners are less likely to find the computer tutor boring. Computer learning has also been noted to reduce anxiety on the part of the learner (even though some of the feedback in early programs was fairly judgemental) and so reduce the 'affective filter'. Computer programs can break language or curriculum content into component parts rather than focussing on the whole and so present the learner with a series of achievable output tasks and record their errors at the same time.

Whilst some of these arguments are valid, some of the advantages of the computer as *tutor* have particular implications for EAL learners. Although practice or repeated exposure is seen by some researchers as beneficial to skills development, in other studies learning gains appear largely to be due the increased amount of time learners spend on the tasks. It is also unclear whether language skills acquired in the context of a program are naturally transferred to other areas and activities which is crucial for EAL learner development. Skills programs break down the language or content learning into component parts and so develop 'correct' but compartmentalised output rather than encouraging processing of language at a deeper level. Some researchers have identified significant concerns regarding integrated learning systems (for example Successmaker) querying ' *the nature of the research purporting to show progress, the measures by which this progress is understood, the ability of the learner to transfer attainment to other contexts, the closed nature of most ILS systems, the lack of collaborative work, the cost, the cultural bias and the danger of de-skilling teachers who may have no clear role to play where ILSs are used.*' (Abbott, p3). This is not to say that programs have not developed. Modern programs do now combine language skills (e.g. speaking and writing) often in a meaningful context. Programs can 'understand' some of the user's spoken and written output and provide feedback. However language work on a computer is not the same as authentic communication and so is limited in how far it can support learners to learn and process language. For example, programs do not provide formative feedback that can help learners identify how they could improve. Programs cannot discuss with the learners why they have said or written something in a certain way and how appropriate it is in the particular context. Programs cannot differentiate between the learner understanding of content and the means to express that content appropriately. The limit of artificial intelligence raises questions as to how 'interactive' programs can be – that is how closely they can recreate communication and the negotiation of meaning which is the essence of language use.

CMC on the other hand has created new ways to interact and use language actively, some of which have particular advantages for EAL learners. For example, research quoted by Warschauer (2004) indicates that written CMC encourages learners to ask more questions, use different language functions more frequently and produce more language altogether. Email exchanges appear to encourage language that is less narrative and descriptive but more personal, expressive and argumentative. Participants in an email exchange do not share a physical location so much of the context needs to be made explicit rather than assumed but the register is more speech like and less formal than other forms of writing. Communication through email may therefore support EAL learners to move from speech to text. Similarly the preparation of electronic multimedia communication may allow learners to extend their communicative output through the support of graphics, sound, video and presentational elements. Research indicates that this does not necessarily lead to a focus on what some may see as peripheral aspects of the communication, but that it can afford learners the opportunity to begin to express linguistically complex ideas more successfully.

However, an advantage of CMC and ICT more generally is not just that it provides more opportunities to create more output in different forms but also that it supports EAL learners to be more conscious of their language use and more willing and able to develop their output collaboratively. Research evidence suggests the public nature of much CMC makes learners acutely conscious of their language use as well as providing the opportunity to refer to limitless models of similar output to enhance and improve their work. The authoring of web pages is seen by some as an excellent vehicle for developing collaborative writing, involving not only known peers, but also unknown readers and authors. Additionally, the recording of aspects of language which happens automatically through most ICT use allows learners (and teachers) to be conscious of aspects of language use that would otherwise be fleeting and unnoticed. It allows learners to review, modify and evaluate their language output with peers, teachers and independently. Collaborative or individual modification of ICT based output appears more productive and acceptable perhaps because output is essentially less fixed. Word processing documents or desk top publications can be redrafted, websites extended or relaunched, digital video frames cut and emails held as drafts whilst the writer considers and redrafts the text.

Drawing the learner's attention to the relationship between form and function; making key grammatical elements explicit

Whatever language is needed to talk about the content, it should be used in ways that allow the learners to take note of the language itself. Attention should be drawn to language and how it is used to express the content knowledge. This can mean explicit comment on forms, structures and functions of the language that is used to convey the content, as well as in more indirect ways of calling attention to language

Learning EAL through the mainstream curriculum requires frequent opportunities to take note of how language is used to express content knowledge and so understand the relationship between form and function. The starting point is awareness of the language used in the mainstream curriculum, not only because learners need to develop curriculum understandings but also because this provides them with the depth of exposure to cognitive academic language required. Learners need to make sense of the content of a each piece of input and focus on how language is used within it to build an understanding (based on continuing experience) of how the target language functions. This involves integrating language learning into all aspects of the content curriculum.

Making key grammatical forms explicit was the raison d'etre of behaviouristic CALL programs. Repeated exposure to certain forms was provided which were practised until the learner 'got them right'. The shortcomings of this approach (and to some extent later communicative language skills programs) was a recognition that the ability to manipulate prefabricated language represented only the beginning of a continuum of language use as well as concern about the transferability of 'context free' language skills acquired in this way. As Jim Cummins notes with regard to vocabulary '*there is a significant difference between the 'comprehension' reflected in simple word recognition and the 'comprehension' reflected in ability to use the word in a semantically and grammatically appropriate way*' (p 10). Similarly there is a difference between: choosing the correct subject-verb agreement from a list of options; supplying the correct subject-verb agreement in sentences and using subject-verb agreement correctly when writing up the results of a science experiment.

Whilst skills programmes generally have prescribed learner pathways, vocabulary, grammatical constructions and language functions, multimedia offers a more i*ntegrative* way to support EAL learners' language and content development together. As discussed earlier, the linking of multimedia resources means that curriculum based input can foreground content or language depending on the situation, learner or learning intent. The language prompts and tools are inbuilt and so allow learners (or teachers) to navigate their level of language focus and support at the same time as working with content. In the e-Lective example previously mentioned, in the first reading of the text (for meaning) the imaginary learner chooses to access the L1 equivalents to get to meaning. During the second and subsequent reading the learner accesses support to understand how the language is used to present the meaning which has been clarified and to investigate other ways it could be presented. Similarly the teacher can initially foreground the content or meaning of an input and subsequently focus on the language use or can switch between the two through a session. The fact that the level of use of prompts and tools is not pre-determined offers a way of recognising the language learning continuum. Software of this type is complicated and expensive to develop and is currently very limited.

Generic ICT applications have inherent *tools* and attributes which can in the meantime be used be used to draw attention to language and how it is used to express content knowledge. The findings of a US survey suggest that ESL teachers are most likely to use generic software tools with ESL students, followed by software products designed for L1 speakers with ESL/bilingual specific software representing less than five per cent of use. Similarly a recent survey in the UK found that few EAL teachers use EAL specific software or websites. Generic tools and attributes of everyday ICT can be used to focus on language in numerous ways. Automated processes such as templates, master pages and wizards focus on the key linguistic and presentational aspects of associated texts and can be used to make these explicit. Using Publisher or Word templates or writing frames can provide

learners with a model of the genre of certain texts. Web sites or PDF documents expose the organisation of a huge variety of texts types. Speech to text functions can be used to support learners to segment the speech stream or to focus on the difference between curriculum content expressed in speech and writing. The recording of language which is an attribute of most ICT applications provides an inexhaustible supply of authentic content based language in a form which automatically allows learners to take note of the language itself. Teachers only need to incorporate the use of these generic tools and attributes in their teaching to be able to draw attention to the language and how it is used to express content knowledge.

Developing Learner independence

Learners need increasingly to become more independent in their use of a range of learning strategies, drawing on metacognitive (e.g. organisation/planning), cognitive (e.g. grouping/classifying) and social-affective (e.g. co-operation) awareness. The teacher has a key role in encouraging pupil independence through the selection of planned activities and by assisting learners to apply strategies which develop self reliance.

Developing learner independence through the application of appropriate learning strategies is key to the continuing and self sustaining nature of effective language learning. ICT provides significantly different opportunities for autonomous learning which EAL teachers have a responsibility to support learners to access and use. For example, simply writing or reading through a word processing program with an internet connection supplies the learner with a number of potential scaffolds. Grammatical errors outlined in green, spelling errors in red and online access to synonyms, dictionaries and translations. However many of these tools are based on the assumption that the user has already internalised many concepts as a first language English user. The learner will therefore need support to recognise how, when and why these scaffolds are useful in their language learning and use.

Similarly, independent and autonomous access to web based ESL skills programs may be a language development route for some EAL learners but formative assessment from the teacher will support its effectiveness. The use of the web has also revolutionised access to research, information and critical comment. But the hugeness of the web has frustrated many EAL learners and the problem of plagiarism has frustrated many EAL teachers. Teacher guidance to develop effective search and select skills can enable learners to access the support they need for curriculum access and language learning. By selecting planned collaborative activities and scaffolds such as web quests or guided web searches teachers can assist learners to develop independent research skills, purposeful reading skills as well as identifying the differences between modelling, copying and plagiarism. ICT is not only about engaging stimuli and developing collaborative learning but also about empowering EAL and bilingual learners to engage in autonomous learning at a level comparable to their English speaking peers. And this requires teacher mediation.

According to Warschauer (2004) teachers need to ensure that learners develop skills in 'electronic literacy'. This concept includes *computer literacy* which is fluency in using hardware and software; *information literacy* which is ability to find, analyse and critique information available online; *Multimedia literacy* which is the ability to produce documents combining sounds texts, graphics and video; and *computer mediated communication literacy* which is the skills of synchronous and asynchronous CMC. Within this he suggests a strategic emphasis on communication, construction, research and autonomous learning.

It strikes me that in striving to create classroom situations which optimise the how, when and why use of ICT to support the teaching and learning of EAL pupils, we could do worse than reflect on our activities on that basis. Does the planned use involve *communication* about and through both language and content? Does it involve the *construction* of content and language by and between learners? Does it involve learner or teacher *research*? And finally does it support *autonomous learning*? Thinking back to my brush with the BBC computer in that primary classroom all those years ago, the answer to all those questions would have been no. Maybe we understood this all along and were just waiting for the technology to catch up.

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