Mobile computer technology as enabler of personalisation of instruction and learning.

M. Vergoossen-Ottevanger
Arnhem International School, 2013

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Acknowledgements

Thanks to the ready availability of research reports, publications from educational magazines and pamphlets on educational or government websites, the findings of researchers could benefit this project. I am grateful for the support of the Specialist Schools and Academies Trust, who readily supplied me with the papers I requested. I am thankful for the contribution of the students of Arnhem International School involved in this research project, who willingly gave feedback on their learning experience.

Abstract

Personalisation of instruction and learning is widely seen as a prerequisite for successful 21st century education. The integration of technology in instruction and learning is often seen as a key enabler for personalisation. This paper considers the circumstances under which mobile computer technology can enable personalisation of learning and is intended to support Arnhem Internation School's future educational decisions. The findings indicate that students value the possibilities for differentiation offered by mobile tablets highly but also show that it is a combination of aspects such as 'student voice', 'assessment for learning', 'celebrate your learning', 'support and guidance', together with ICT, that motivates students to learn and enhances their learning. It thus becomes clear that technology is not a stand-along miracle of innovation and that in order to be able to personalise instruction and learning, more comprehensive educational measures need to be taken, or one could say, chances lie elsewhere as well.

Introduction

This paper will explore ideas about personalisation of instruction and learning and will investigate how mobile computer technology can support personalisation of learning within the Middle Years and Diploma Programmes of the IB at Arnhem International School.

Arnhem International School is an International Baccalaureate (IB) School with a Primary Years Programme (PYP), the Middle Years Programme (MYP) and the Diploma Programme (DP). These programmes are taught worldwide and enable students to obtain the internationally recognised certificates of secondary education; the MYP certificate and the IB Diploma.

At Arnhem International School students enroll from different educational backgrounds. These students have often lived and received their education in several countries. Some students have previously been at another international IB school. However, the majority of students have been in other educational systems before. Consequently, the students have different levels and diverse areas of knowledge and different knowledge backgrounds.

To some extent, the IB programmes cater for the different needs of students from different educational backgrounds, in that they allow students a wide choice of subjects and levels. An example is the possibility of studying the mother tongue as the compulsory first language in a "self-taught" course, if the language in question is not taught at the school.

It remains a fact, however, that in spite of this flexibility in choices of subjects and subject levels, there is an extensive need for further *individualisation* of the instruction by the teacher in the classroom due to the diverse knowledge levels and knowledge backgrounds of the students and the different learning speeds. *Individualisation* is defined by the US department of education as referring to "instruction that is paced to the learning needs of different learners. Learning goals are the same for all students, but students can progress through the material at different speeds according to their learning needs. For example, students might take longer to progress through a given topic, skip topics that cover information they already know, or repeat topics they need more help on." (US Department of Education, 2010)

The need for adaptation of the instruction to the learners' needs is not only caused by the diversity of student levels, but also by their individual learning styles and sometimes also learning difficulties. This can be called the need for *differentiation*. *Differentiation* refers to instruction that is tailored to the learning preferences of different learners. Learning goals are the same for all students, but the method or approach of instruction varies according to the preferences of each student or what research has found works best for students like them. (US Department of Education, 2010)

With regard to differentiation, the IB favours an integrated approach: "Historically, the special education teacher was separate from the class and/or subject teachers and was often consulted only after a difficulty or issue became identified as a problem. Over time, changes have taken place that have altered the focus from a medical model of a student with a deficit to a focus on the whole child. This focus has shifted to practising differentiation through identifying a student's learning style, scaffolding their learning, and differentiating the curriculum in order to develop the student's true potential." (International Baccalaureate, 2) This statement underlines the importance of differentiation organised not as individualised, separate tuition, but centred around the regular classroom.

This need for individualisation and differentiation of the instruction to the learners' needs constitutes the main reason for this research. The term *personalisation* covers both individualisation as well as differentiation: the US department of education defines personalisation as referring to "instruction that is paced to learning needs, tailored to learning preferences, and tailored to the specific interests of different learners. In an environment that is fully personalized, the learning objectives and content as well as the method and pace may all vary (so personalization encompasses differentiation and individualization)."(US Department of Education, 2010)

Sebba, Brown, Steward, Galton and James (Sebba et al, 2007) report that personalised learning is often interpreted as individualised learning that can be organised by special arrangements like individual pathways, individual timetables or individual learning programs. Personalised learning may entail elements of individual learning, but personalised learning does not place the same emphasis on the individual learner. As Sebba et al rightfully point out: "The power of personalised learning is in its potential to recognise the 'personal' in teaching, learning and schooling so that all pupils experience and are motivated by a sense of belonging and view the learning as relevant to them. This can

happen equally in whole class, small group settings or on a one-to-one basis, which provides targeted support when needed. Most pupils will need a combination of these arrangements to maximise their learning. " (Sebba et al, 66)
David Milliband puts his finger on the importance of personalising rather than individualising learning: "This is what I mean by 'Personalised Learning'. High expectations of every child, given practical form by high quality teaching based on a sound knowledge and understanding of each child's needs. It is not individualised learning where pupils sit alone at a computer. Nor is it pupils left to their own devices – which too often reinforces low aspirations. " (Milliband, 8)

Within this report the term *personalisation* will be used to refer to both individualisation and differentiation, within the scope of identical learning goals for all students and within the scope of their subject level and with the emphasis on 'personal' rather than individual in instruction and learning. Personalisation is, however, not considered to be a state, but rather a process of developing and personalising the lesson content at hand.

The wish for personalisation of instruction, combined with the call for a more active learning experience, which is assumed to be the expectation of the digital-age students (Kinash, S., Brand, J. and Mathey, T., 640), invite the design of personalised learning facilities. Keamy et al (2) see the explicit use of ICT, integrated into the teaching strategy as a key enabler of personalised learning. Jones and McLean (89) describe the effective use of technology as being widely recognised as a crucial component of modern education and to be increasingly seen as an enabler of learning.

The need for personalised tuition at Arnhem International School is especially apparent in the subject English and therefore this project will be conducted within one of the English courses. Since English is the language of teaching at AIS, a lack of knowledge in English leads to poor performance on the part of the student in other subjects as well. Even though the school has recognised this and provides individual language support, this is only limited to a few students. An integrated approach has preference.

One specific problem in the subject English is that non-native speakers have difficulty both in pronouncing English correctly and consequently making themselves understood. There is no time to support these students with their pronunciation. (It should be noted at this point,

that 'correct pronunciation' should be interpreted as inclusive of local or international varieties of English pronunciation.)

Literature Review

The literature review will comprise study into the following aspects:

2) personalising education

2) use of modern information technology in and outside the classroom

Selection of Publications

Electronic and hand searches were performed, aiming at finding relevant and recent information regarding the use of mobile technology-assisted (language) learning and regarding personalisation of education, with the use of terms such as 'computer-assisted language learning', 'MALL' (mobile-assisted language learning), 'ipads', 'student motivation', self-paced learning', 'differentiated learning', 'differentiation', 'personalisation', 'personalised learning'. Nearly 250 seemingly relevant and recent references were retrieved through the online digital library of education research and information ERIC (the Education Resources Information Center), through the Australian, British and American Ministries of Education, the Specialist Schools and Academies Trust website, iNet, as well as from the IB's International Education Research Database and the Dutch Kennisnet database. The abstracts of the relevant publications were scanned to select the relevant ones.

Personalising education

The literature review soon made clear, that with our project of diversification by means of mobile computer technology, we are entering through a side door into a discussion that has been held by educators world-wide for quite some time already. Researchers study how education, instruction and learning have to be adapted to the demands of the 21st century learner. In 2001 Marc Prensky states: "Our students have changed radically. Today's students are no longer the people our educational system was designed to teach." He calls students "Digital Natives" and he refers to their teachers as "Digital Immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language." (2) Kinash, Brand and Matthew (640) report that many publications (Andone, Dron & Pemberton, 2009; Annetta, 2008; Kim,

Jain, Westhoff & Rezabek 2008 and many others) recognise the changed demands of the 'Digital Native' (Prensky, 2001) student and point in the direction of new technology as the solution.

Is mobile computer technology the solution? In the Australasian Journal of Educational Technology, Kinash, Brand and Matthew (640) confront the "universally expected rationale for mobile learning" as being something the "tech-savvy 21st century learners" simply expect, with a discussion of the learning effect. Although they found proof that the new use of mobile computer technology led to a higher motivation to learn in a research project involving 135 undergraduate students, there was no proof of an enhanced learning effect (650). Merely expanding the use of ICT alone, does not seem to be the solution.

A more comprehensive view on the modern day learner and education was offered by David Hargreaves, who compared the 'educational imaginary' of the 19th to that of the 21st century (Hargreaves, 2006, 46):

> "The 19th century educational imaginary:
> - Schools prepare students for their fixed stations in life
> - intelligence is mono-dimensional, fixed and innate
> - schooling is limited for the majority
> - the teacher is the gateway to knowledge
> - school is designed like a factory
>
> The 21st century educational imaginary
> - students' identities and destinies are fluid
> - intelligence is multiple, plastic and learnable
> - education is lifelong
> - ICT removes space and time barriers to knowledge
> - education services are designed to personalise learning"

In 2004, Hargreaves argued that

- personalising learning is realised through nine interconnected gateways
- personalisation needs to be treated as a pathway to educational transformation
- a radically different system of innovation and development

- and research for education is needed.

Hargreaves points out that in the 21st century the focus in education moves away from instruction to learning. Personalised learning was defined by David Miliband when he was DfES Minister for Schools: 'Personalised learning demands that every aspect of teaching and support is designed around a pupil's needs...' (Milliband, 2004). Hargreaves advocated the use of the term 'personalising' rather than 'personalised' (Hargreaves, 2006) which according to Sebba et al (2007, 15) emphasised that "this is a process not a state or product." In 2005, the Secretary of State Ruth Kelly indicated that: "Our plans for boosting performance and standards across education are far reaching and radical. We aim to put learners, young people - and their parents - in the driving seat, shaping the opportunities open to all learners to fit around their particular needs and preferences. (...) "Technology is the key to personalised learning"(Kelly, 2)

The British government thus called for better results in education and saw the answer in personalisation of education, with technology as the key to success. The Specialist Schools and Academies Trust (SSAT) and the Association of School and College Leaders (ASCL) thereupon organised what was going to be a very interesting series of conferences with some 200 teachers and school leaders, focusing on personalising education and learning. They discussed the 9 gateways to personalise learing, defined by Hargreaves (Hargreaves, 2004, 2), which offered a more detailed picture of personalisation. As a result of these conferences these gateways were later clustered in what was called 4 'deeps' (Hargreaves, A shape for new schooling, 2006, p. 6-7); 'Deep Learning', 'Deep Experience', 'Deep Support' and 'Deep Leadership''.

Deep Learning

Emma Sims explains that "deep learning is secured when, through personalisation, the conditions of student learning are transformed" (Sims, 2006) and refers to the first usage of the term 'deep learning' by Noel Entwistle and colleagues in the 1980s, who associate deep learning with the learner's intention to understand ideas for her- or himself, rather than for coping with the course requirements. Deep learning can be reached through the gateways *student voice* - means by which students articulate their needs and become involved - *assessment for learning* - with aspects such as awareness of lesson objectives, formative assessment, peer- and self-assessment - and *learning to learn* - with elements such as learning styles, awareness of multiple intelligences, working of the brain. They require students and teachers to work in partnership, while placing emphasis on students taking

more responsibility for their own learning and progress. (Sims, 2006) Sims admonishes to mind Hargreaves 'leverage innovation'; teachers are required to work smarter rather than harder, thus removing the danger of their becoming exhausted or burnt-out.

Deep Learning - Student Voice

While Sims recognizes that most schools give some opportunity for student voice, usually through student councils, she argues that the issues discussed with the student council are hardly ever concerned with the core business of schooling, and continues to say that "Student voice, at its best, involves a significant number of students in the more challenging areas, such as students as researchers, students as lesson observers and students interviewing prospective members of staff."

Through enhanced student involvement students feel more valued, and when they are listened to, they are more likely to engage in co-construction.

Deep Learning - Assessment for Learning

The ideas on assessment for learning as envisaged by the SSAT Trust schools are already an integral part of the IB curriculum and teaching practise. These ideas do, however, reinforce the necessity of formative assessment in the Diploma Programme, where it is not as firmly integrated as it is in the Middle Years Programme.

Deep Learning - Learning to Learn

According to Sims, key to the effectiveness of learning-to-learn programmes is the development of meta-cognitive skills, in other words thinking about and reflecting on one's learning. Through the development of meta-cognition students are encouraged to monitor, evaluate, control and reflect on their own learning, thus making a powerful contribution towards their development as confident and independent learners.

The familiarity of students with learning outcomes and assessment criteria that Sims recommends, is an integal part of the IB programmes already.

David H. Hargreaves interestingly argues (Hargreaves, 2008) that the moral purpose of learning should not be made synonymous with fulfilling the potential, which becomes getting a good qualification, but should be concerned with students' physical and mental health, protection from harm and neglect, enjoyment and achievement in adult life and economic well-being (the British government policy 'Every Child Matters'). Paradoxically, schools that aim to be 'good schools' treat reaching the benchmark of successful exam results as a high or even top priority. Schools that perform poorly in national exams or do not meet the inspection's goals, tend to adopt quick-fix approaches to reach the floor target. Hargreaves suggests that the richer and more worthwhile 'ECM' ('Every Child Matters')

definition of moral purpose behind learning will allow a different interpretation of moral purpose from school to school, as each develops its distinctive philosophy and ethos, reflecting the vision of governors, headteacher and staff and the views and circumstances of the community it serves. Although some quick-fixes work on a short-term basis, a school focus on the longer-term vision of personalising learning will ensure sustainable improvement. Hargreaves is a strong advocate of project work as enabler of deep engagement and deep learning. As advantages he claims that projects:

- have ambitious goals
- stretch abilities and talents
- demand active involvement
- are team events, requiring close collaboration
- require dedication and commitment
- need long, and often hard preparation — various forms of training and rehearsal
- depend on feedback from a coach or mentor
- end in some kind of public performance or display as a climax

Within the MYP, teaching takes place in disciplinary or interdisciplinary units, which may take the form of projects, of which the learning outcome is celebrated in a final task. Within the DP this is less often the case.

Deep Experience - with the gateways 'New Technologies' and 'Curriculum'.

Hargreaves states that "Deep experience is secured when schooling is restructured to ensure that all students are fully engaged in their learning." and describes deep experience as ensuring "educational experiences with enriched opportunities and challenges" (Hargreaves, Deep experience 1, 2006, p.2) Among three solutions to counter students' disengagement, Hargreaves mentions the 'transformative power of the new technologies", but only after emphasizing the importance of project-teaching as a way to engage students' interest. In line with organisational reforms suggested in Deep Leadership (Hargreaves, Deep Leadership, 2006), he commends the 'Flexible Friday' of Leasowes Community College (Hargreaves, Deep Experience - 1, p. 13) during which students are not working according to the regular timetable, but work on bigger, interdisciplinary projects.

Hargreaves rejects the idea that new technologies are inherently motivating to school students beyond the short-term novelty effect and warns against ICT directed "at a kind of decorative enhancement of conventional teaching, an attempt to put some extra zip into

tired lesson designs." (Hargreaves, Deep experience 1, 2006, p.25) For new technologies to be transformative, they must change the experience of schooling in profound ways and will effect: *the teacher's role* - to becoming more of a mentor and coach who helps students to locate, select, evaluate and marshal material - *the student's role* - to becoming more autonomous learners, *project design* - allowing for more creativity, *the synchronous co-location of teacher and learners* - which becomes less important- etc.

Deep Support — with the gateways 'Mentoring and Coaching' and 'Advice and Guidance'. Whereas 'deep support' was originally placed in the gateway of advice & guidance and mentoring & coaching, Sue Williamson (Williamson, 2006) later envisages it as surpassing this and employs the term 'deep support' for the support of the learner by various people, materials and ICT linked to well-being but crucially focused on learning. Sue Williamson advocates a learner-centred *student learning information database* as one of the conditions for deep support and argues that nowadays systems tend to be for the benefit of the school or the staff. She envisages ICT as one of the main enablers of deep support for learning and mentions ePortfolios as a way for students to collect, share and celebrate their achievements. ICT should also be used to plan, monitor and assess pupil learning. According to Williamson, ICT can extend the learning possibilities of students significantly beyond the time and space that the teacher is available to them and can thus cater for diverse individual needs.
Williamson further advocates vertical tutoring.

Deep leadership — with its gateways 'Design and organisation' and 'Workforce reform' — means redesigning education so that, "through a culture of personalisation and co-construction with shared leadership, the school secures deep experience, deep support and deep learning for all its students." (Hargreaves, Deep Leadership, 2006) Hargreaves advocates a leadership in which 'structure follows strategy' and names the advantages of strategic intent as giving the organisation and its staff a 'sense of direction', a 'sense of discovery' and a 'sense of destiny'. Many of the schools under the SSAT Trust organisation have changed their organisation and made learning-related tasks management roles. Another example of adaptation of structure to design was the 'stage not age' decision of Bridgemary Community Sports College (Hargreaves, Deep Experience, 2006) to remove the horizontal banding of students in years to replace it with a structure that enabled vertical learning groups within subjects.

In this very comprehensive model of professionalisation of instruction, ICT is embedded in a larger structure and not a stand-alone miracle of innovation. Hargreaves and his colleagues and the conference participants have made clear, that to move to a new model of education, fit to meet the demands of the 21st century, much much more needs to be done within education regarding and beyond the mere implication of new technology.
Looking back after many conferences, Hargreaves formulates it as follows:
"The professional journey we have undertaken (...) can readily be summarised (...). The journey began on the basis of a few ideas and nine gateways, with limited understanding of the order in which they might be explored and the complex relationships between them. Eighteen months later, it is clearer that the movement from the 19th-century educational imaginary to that of the 21st century mirrors changes reported in the economy and wider society. This is also embedded in a trajectory from mass production, through mass customisation, to the experience economy and the co-created economy. Now we can re-conceptualise the nine gateways as forming four clusters – deep learning, deep experience, deep support and deep leadership. These ideas will help to guide the next steps in the journey of personalising learning, and especially the creation of models of the design and organisation of schools that most fully personalise learning. It is these schools that will take the lead on the path to educational transformation." (Hargreaves, 2006)

Sebba et al were among the first to actually do empirical research on the personalised learning approaches used by schools and they took the DfES's description of five components of personalised learning as a starting point; 'assessment for learning', 'effective teaching and learning', 'curriculum entitlement and choice', 'school organisation' and 'beyond the classroom'. (Sebba et al, 6) It becomes clear that different research groups contribute different components to personalised learning. What all publications and research have in common, is that they refer to ICT as one element, embedded in a range of measures enabling and supporting personalised learning. The schools partaking in Sebba et al's research personalised learning to cater for different learning groups and for different reasons and implemented the five components of personalised learning with varying emphasis. (Sebba et al, p. 3, 66) Valuable information can be drawn from the experience of these participating schools.

Research has been done on the integration of ICT in education, as a stand-alone measure of

personalisation or as one of many measures such as those as described by Hargreaves (2006). Jones and McLean describe a call in all sectors of education for meaningful integration of technology in teaching and learning (Jones, McLean, 75). These Canadian researchers dedicate their research to the effective integration of technology as an enabler of personalising learning (Jones, McLean, 75). Jones and Mc Lean conclude that technology can act as a key enabler of personalising learning within the higher education context of their research. Their findings suggest that this occurs best when three fundamental steps are followed:

- The learning outcomes drive the context and the ICT becomes the enabler of learning in this context (*Authenticating the Context*)
- strategies are implemented for catering for diversity of abilities and interests based on the use of formative assessment (*Catering for Diversity*)
- learning is assessed and recognised in a manner that best recognises student achievement and builds esteem which is considered under the umbrella term of *Celebrating the Learning*. (Jones and McLean, 88)

This model does not differ significantly from Hargreaves' model and equally emphasises the importance of curriculum integration and ICT use - similar to the 'deep experience' (Hargreaves, 2006) and diverse learning skills and interests and formative assessment - similar to the 'deep learning'. Jones and McLean see 'celebrating the learning' as a separate step. They argue that 'Recognition of learning through value-added assessment approaches, and through presentation of achievement, acknowledges learning and contributes to this sense of building value and self-esteem in learners.' Hargreaves equally connects the depth of learning to a celebrating of the learning success achieved (Hargreaves, Deep experience 1, 2006) but doesn't give it as important a position. The celebrating of what has been learned, is pedagogically useful but cannot be achieved for all lesson content.

Research has also been done on the technical issues involved with the use of mobile computer technology in education. An extensive survey was done by Susan Crichton, Karen Pegler and Duncan White to "gain an understanding of the infrastructure required to support handheld devices in classrooms; the opportunities and challenges teachers face as they begin to use handheld devices for teaching and learning; and the opportunities, challenges and temptations students face when gaining access to handheld devices and wireless network in K-12 schools" (Crichton et al, 23) in a large urban Canadian school board.

Many of the problems Crichton et al describe, are related to the use of a wireless network. During the pilot project at Arnhem International School, students will not receive access to a network. Nevertheless, the survey has great relevance for AIS because of the extensive experience with mobile technology, and will become even more relevant, should AIS decide to continue the integration of hand-held devices in its teaching beyond the range of the pilot project. The survey offers many useful technical recommendations and a guide for schools who are looking to integrate mobile learning.

After evaluating the data from their extensive research, Crichton, Pegler and White suggest that iDevices (iPods and iPads) can be integrated successfully, provided several conditions are met. First they indicate the necessity of "a specific mobile learning oriented infrastructure to support [the devices]" (Crichton et al, 29). The survey describes the ICT-related problems that came up during the integration of iPods and iPads in teaching and lists solutions that were found. Second, they point out that teachers need to be given the chance to get to know the devices and the ict-related issues surrounding them (e.g. uploading, charging, syncing) before they are asked to use them in their educational practice. In agreeance with Hargreaves (Hargreaves, 2006) and Jones and Mc Lean they point out that it is important that "teachers design tasks that are consistent with the curriculum and use the apps and the access to the Internet in integrated and meaningful ways." (Crichton et al, 29) They had found that "the majority of students were not interested in simply using the devices; the use had to be tied to the curriculum." (Crichton et al, 30) An interesting find was that older students benefited more from working with the devices when they were allowed to take them home and have access to relevant, course related content such as eTextbooks.

Although the researchers indicated that they want to continue work with Apple to make access to the digital commons more seamless, they also indicate that it remains to be determined whether Android or LINUX based tablets might not be a better fit for public education because of their more open app development structure, price point, and non-proprietary operating systems. (Crichton et al, 30)

Should AIS decide to use ipads on a structural basis beyond the pilot project, it is worthwhile to consider whether ipads should be bought, owned, charged and uploaded by

the students themselves. In the case of student ownership, many of the problems that came up in the Canadian school can be avoided, though almost certainly, other problems will arise.

Many studies look into the use of mobile devices for learners on an individual basis within the classroom. It seems, however to enhance creativity in teaching and collaboration among students to reserve the ipads for group learning in class and to facilitate individualised study outside the classroom. When each student is provided with a tablet, teachers are at risk of pursuing a new kind of frontal teaching; one in which collaboration and communication are not encouraged and the risk of reduced feedback exists. This is supported by Kristin Redington Bennett (Redington Bennett, 2011-2012) who advocates the use of less than a class set of ipads and suggests creative uses of the ipads like small-group whiteboards. Jonathan P. Rossing argues: "Moreover, the size and design of mobile tablets invite increased collaboration. Computer labs often restrict students to individual stations with screens and towers that prevent easy information sharing. Laptops still create physical barriers in the form of screens. While laptops are more easily twisted and passed, they hinder a more communal and synergistic interaction. Mobile devices diminish some of these physical barriers; they can be passed among students as simply as a book. The hands-on device encourages easy sharing of work, and requires a physical closeness that fosters greater interactivity." (Rossing, 2012) Outside the classroom, however, students can use the devices to access the course material or practise lesson content with teacher-selected applications. This enables students to self-pace their learning.

Research by Yong Zhao seems to confirm that "it is reasonable to conclude that technology has been shown to be very effective in improving student language learning" (Yong Zhao, 19) and in this AIS can find a general confirmation of the validity of the assumption that technology can support the teaching of pronunciation and listening comprehension. Yong Zhao explains in his Meta-analysis of studies between 1997 - 2001 that "the application of technologies can be effective in almost all areas of language education. Modern technology can help enhance the quality of input, authenticity of communication, and provide more relevant and useful feedback." (Yong Zhao, 22) He argues that "access and exposure to engaging, authentic, and comprehensible yet demanding materials in the target language is essential for successful language learning". (Yong Zhao, 10) Since MacMillan's AE Sounds

application uses authentic native speaker material, this can be seen as an advantage and a valuable extension of instruction time.

Interesting as well are the findings of Swan, 't Hoof, Kratcoski and Unger (2005), who researched the connection between mobile devices and student motivation among elementary and middle school students. They conclude that "The findings suggest both the personalization of learning supported by such devices and their potential usefulness in amplifying learning that may already be happening beyond the classroom. They also suggest that students easily adapt the use of mobile computing devices to their own needs and hint at the influence of classroom cultures on this appropriation. The findings hint at benefits of collaborative uses of such devices as well, especially during the editing process. The results of this study further indicate that use of mobile computing devices may increase student motivation to learn and increase their engagement in learning activities, which in turn, could lead to an increase in time spent on learning activities and higher quality work. " (Swan, van 't Hooft et al, 109-110). However, Swan et al also point out that the Hawthorne Effect[1] should be taken into account when considering their results. The same effect might have to be taken into account during the AIS project, since it will be restricted to a relatively short period of time.

With this research a side-door to a long-held discussion was opened. Thanks to the availability of research reports, publications from educational magazines and pamphlets, free memberships, the findings of researchers will benefit this project.

Pronunciation and listening comprehension will be taught and trained by means of mobile computer technology but will embed as many other of the 'gateways' (Hargreaves, 2003) to personalisation as possible. The concept of 'celebrating the learning' (Jones, McLean, 2012) will also be embedded. Research of others has shown, that ICT can be used as an enabler of learning, provided many other measures are taken (Hargreaves, 2006). Enriched with this knowledge, this project will be constructed and an attempt will be made at receiving qualitative feedback on as many of these measures, as can be integrated in this project.

[1] The central idea behind the Hawthorne effect, a term used as early as 1950 by Elton Mayo and Fritz Roethlisberger, is that changes in participants' behavior during the course of a study may be "related only to the special social situation and social treatment they received. <http://en.wikipedia.org/wiki/Hawthorne_effect) 03.01.2013

Objective of the Research

The objective of this research is to determine under what circumstances modern mobile tablet computer technology can enable personalisation of instruction and learning.

This research examines how, in the subject English, and under what circumstances the learning of pronunciation can be personalised through the use of the AE Sounds application and supporting educative materials from Macmillan Education on tablet computer technology (ipads) in group- and in individual sessions.

The results of this research could be used to look into the opportunities offered by digital equipment for personalising learning in other subjects taught at AIS.

Statement of the Research Question

How and under what circumstances can mobile tablet computer technology enable personalisation of instruction and learning?

Research design

The purpose of this study is to determine how and under which circumstances personalisation of instruction and learning can be achieved with the aid of mobile computer technology. The literature review clearly brought to light that the use of information technology needs to be set in a context of several elements favouring an effective personalisation. Thus the research has been expanded to cover these elements.

The research was conducted among two group of students (native or near-native speakers) in English A, one in their first year of the Diploma Programme and one in the last year of the Middle Years Programme and was done under the supervision of one teacher. The project was conducted during regular classes. The teaching of pronunciation and the phonetic alphabet was chosen as didactic content for this project, since the iPads could be

used as training tools, after an initial teacher instruction. Normally, pronunciation would hardly ever be addressed in the English A classes, although it would make sense, especially for the non-native speakers in the group. For all students, knowledge of the phonetic alphabet would be useful, since it will enable them to look up unfamiliar words in a dictionary. Since the students are no longer in their native language environment, and most have only been taught in English discontinuously, this will be extremely useful. The well-developed professional teacher support material by Adrian Underhill and the AE Sound application (MacMillan Education) enabled both frontal class instruction as well as personalised (group and individual) learning. It caters for a diversity of regional or international dialects and, through its digital sound chart, models the sounds. The AE Sound application and mobile computer technology enable students to practise pronunciation away from in-class inhibitions or to practise in smaller, safer, groups. The AE Sounds app makes use of authentic language material spoken by native speakers, a voice recording and audio facility.

In both grades, 5 Student groups were formed of 4 to 5 students. Each group had to have at least one non-native speaker. Each group appointed one 'learning coach' - a student who was concerned with learning strategies of individual group members, one 'creative director' - a student who lead the design of the final group task, and one 'assessor' - a student who co-decided on assessment criteria on behalf of the group and who co-accessed the group tasks. This was done with the intention to integrate the gateways for personalised learning (Hargreaves, 2003):

Deep learning

1. Assessment for learning:
- is already established within the IB (formative assessment and assessment criteria)
- students are aware of the assessment criteria

2. Student voice:
- students will decide on the format and technology choice of the final group task
- The assessors (students and teacher) established three assessment criteria, adapted or adopted from IB assessment criteria,

These were:

Criterion A: Content: Effort and difficulty of task chosen

	Criterion B: Organisation Criterion C: Style and Language Usage 3. Learning to learn: - co-deciding on learning paths (visual, auditory, audiovisual, repetition, peer support, ICT etc.)
Deep experience	1. ICT: - students may book/use the ipads with the MacMillan AE Sound application individually or for group work - students use their favourite technology to present their group work 2. Curriculum: - a final group task; - creative director guides group decision on final group task
Deep Support	1. mentoring and coaching - group support on technology - group support of weaker/individual student 2. advice and guidance - learning coach - teacher

In an initially frontal instruction, all students in the English A groups were taught the English phonemic set of sound symbols from the international phonetic alphabet. They were taught to recognize them and locate them on the phonemic chart that orders them according to vocal tract elements (e.g. jaw open, jaw closed, tongue forward, tongue in the back) (according to Adrian Underhill's detailed instruction for the teaching of the phonetic alphabet, Underhill, 2011). As Adrian Underhill indicates in his book Sound Foundations these are the symbols used by most learner dictionaries, so working with them will also help learners develop the skills of finding for themselves the pronunciation and stress of any word in a learner dictionary. (Underhill, 1994) Although this was particularly helpful for the language acquisition of non-native speakers, the native speakers among the students also benefitted from this skill since many had left their native background.

In a second step, students practised these phonemic symbols in listening and speaking exercises with the help of the ipads. Thirdly, students practised on an individual basis with the language trainers. All students had to achieve the same learning goals and in addition some students were set specific pronunciation goals (e.g. aspirating plosives more, producing less nasal sounds). Two tasks were set:

1. Individual task:
note down the correct pronunciation of a set of familiar and unfamiliar words in phonetic symbols
the identification of seen words and a set of unseen words written in phonetic symbols.

2. Group task:
As a further learning outcome, students were asked to use the knowledge and skills required and present their learning to develop "'value-added understanding" and "celebrate their learning". (Jones, Mc Lean, p. 89), (Hargreaves, Deep experience - 1, 2006). In the group task students were asked to demonstrate their improved or better enunciated English pronunciation. Students looked up the pronunciation of unfamiliar words.

It was the first time that pads were used in AIS classes. The pads were financed by Stichting Lely[2] for this project specifically and were bought together with a box to keep them safe, upload and charge them. Since the school has no experience whatsoever with the use of pads in its teaching, the storage, usage, as well as the charging and uploading had to be carefully planned. For the individual training sessions, students booked the ipads with their teacher. A system was created for the administration of ipad-reservations. Because of the first use of mobile computer technology at AIS, it is to be expected that the Hawthorne effect will set in.

[2] Stichting Lely is a foundation which finances exceptional projects within Lorentzlyceum/Arnhem International School, Arnhem, Netherlands. 03.01.2012 <http://www.lorentzlyceum.nl/showpage.asp?pag_id=1098>

Research Methodology

The empirical component of this research involved two groups of students with a total of 35. This constitutes 26% of all students at AIS secondary department. The research was accompanied by the following data collecting instruments:

Audio recording (qualitative):

Student pronunciation was audio-recorded at the start of the project when students were asked to read out a list of words (Appendix 1) and the teacher specifically examined the pronunciation of monothongs, dipthongs, consonants, the intonation and stress. Students were set individual pronunciation-focused tasks.

Questionnaire 1 (quantative):

An inventory was made of students' estimate of their technology skills, their technology interests as well as of their estimate of their own pronunciation. Furthermore, students were asked to reflect on inhibitions they might have regarding the practising of pronunciation. (Appendix 1)

Questionnaire 2 (quantative):

At the end of the project, students were asked to reflect on the different elements of personalising learning that were embedded in the project (as listed in the research design), on their overal learning experience, on learner inhibitions with regard to practising pronunciation, on the use of the MacMillan application and the ipads. (Appendix 2)

Interviews (qualitative):

Of the 35 students 11 were interviewed or responded to questions orally (Appendix 3). These 11 students were randomly selected on the criterion of availability. 6 of these students belonged to the MYP5 class, 5 to the DP1 group.

Observation (quantative):

The teacher observed student behaviour with regard to participation, initiative, collaboration and motivation.

Count:

The number of student bookings of ipads for individual sessions was counted. These were linked to both the group numbers as well as to individual names.

Data analysis and discussion

Inventory questionnaire:

A total of 35 students (males = 14, females = 21) from the English A classes in the 5th year of the Middle Years Programme and the 1st year of the Diploma Programme with ages ranging from 16 to 18 years participated in the research. This equals 26.5 % of all 132 secondary pupils of Arnhem International School. All students completed the inventory questionnaire.

In the inventory questionnaire students were asked to indicate on a scale ranging from 1 = strongly disagree, 2 = disagree, 3 = neither disagree nor agree, to 4 = agree and 5 = strongly agree, what prior level of knowledge and skills they had, related to the use of ICT. Students were fairly positive with an average 4.3 about their ability to work with iPads (100% response); estimated their expertise at working with ICT at 3.7 (100% response) and indicated with an average 4.1 (100% response) that they enjoyed working with ICT.

This was confirmed by the findings at the end of the research project; in the evaluative questionnaire students indicated (100% response) with an average of 4.4 that the use of the iPad had been easy, with a 4.2 (100% response) that the iPad was self-explanatory and with a 1.9 (1 = strongly disagree, 2 = disagree) (100% response) that there had been no/hardly any technical problems. The 5 students who indicated that they had experienced technical problems related these to the App Garageband, not to the iPad itself.

Furthermore, students indicated to have had no or hardly any experience with the phonetic alphabet in the inventory questionnaire with an average 2.2 (100% response).

When asked whether they felt confident about their pronunciation of English, the students answered with an average of 4.1 (100% response), though 12 students thought mispronouncing words in class embarrassing, only 4 of these indicated that they felt insecure if they didn't know how a word is pronounced. 11 of the 33 students indicated that they felt embarrassed when mispronouncing words in class - with 9 answering "agree" and 2 "strongly agree". All these students came from a mixed-language background and are near-native speakers of English.

Count:

In spite of the fact that students were informed several times that the iPads were available for self-study outside classes, they only rarely borrowed the iPads. When asked why, they indicated that there were no free periods during which they could make use of the iPads. When the time during which the tablets were available was extended to the breaks, only 4 students made use of this offer on 2 or 3 occasions.

Interestingly though, students downloaded the free AE application to practise the phonetic alphabet and pronunciation on their home tablets or mobile phones.

Teacher observations:

iPads storage: The ipads were stored in a rack in a safe cupboard in the DP Coordinator's office and could be charged simultaneously. It took quite some time and effort to get the ipads out of the cupboard and into the classroom and back again at the end of each lesson.

iPads app administration: The downloading of applications was organised via a dedicated school Apple ID for the app store. It was quite time-consuming to install the applications on all ipads, but the technical handling of this is very easy and comfortable to do via the app store. Because there was one school Apple ID, the apps could be used on all iPads and had to be paid for only once.

iPads protection: The iPads had protective covers that automatically switched off the iPads when closed.

iPads and students: Students were really eager to get started with the ipads, but precise instructions were needed as to its effective use for learning and teacher guidance was required on how to work both individually and collaboratively with the iPads.

Since there was no wireless network available, the students were not tempted to send messages or visit social networks. The App Garageband was somewhat of a challenge, but students would leave it alone as soon as they had been allowed a peek into its possibilities. The iPad offered the possibility of taking pictures and video-recording. This posed a challenge to students when used outside class.

Pairs or small groups of students worked together well with one iPad, since the tablet screen could easily be seen simultaneously by several users. This invited communication between students about the lesson content. This can be seen as an advantage of tablets over computers or laptops and this confirms the findings of Redington Bennett (2011-2012) and

Rossing (2012). Students quickly became creative in the group use of iPads or the work in pairs and tested each other's phonetic writing skills with the help of the AE app. They willingly engaged in their work and seemed to enjoy it very much. Discussing arose between students about the lesson content and, at times, even competitions.

One observation was also that students took pride in showing themselves able to work well with the iPads. It was interesting to observe that some of the weaker students appeared to have advanced ICT skills and could now take on themselves a new, more positive role as the 'technical director' of a group.

It was interesting to see how students who seldomly participate actively in class, now saw a challenge in learning with the iPads. This was confirmed by the results these students had in the individual tests; unlike their results throughout the year, they performed really well.

Students and AE Sounds App: Students used the AE Sounds App efficiently and easily. Some students listened to the authentic English or American English material more often than others and had a clear preference for auditory stimulation. Others used the phonemic chart as a testing tool for their group members by pressing the sounds without showing the symbols. Students worked with the App and iPads in groups or in pairs. Some preferred working individually. Students who wanted to practise their pronunciation or had been set individual tasks for their pronunciation, seemed to feel inhibited by the presence of others and preferred to take the iPads outside the classroom to work in a quiet corner of the Learning Resources Centre.

Students seemed to feel challenged by the testing facilities that resulted in a score. The male students seemed slightly more often engaged in the AE app exercises that led to a 'score' than female students or communicated this more loudly, when they had little competitions among themselves on who would achieve the highest score.

Students were eager to check their own pronunciation and enunciation with the use of the app; even the native speakers. Some students tried themselves in another variety of English, e.g. a speaker of American English would try British English.

Students had no difficulty using the iPads and helped each other out with the apps (e.g. Garageband) when necessary.

Students as assessors: when the co-assessors (one in each group) were asked to discuss possible assessment criteria for the group task, it took a while before they realised that this was not a trick, but a right they had just been given. So as to make sure they didn't feel inhibited by the teacher's presence, they were asked to discuss the matter among themselves first, before the teacher joined them.

Interestingly, the students were concerned about a fair division of work between the members of each group for the group task. They thought it unfair if students who did much less work, would be awarded a good grade because of the hard work of others. It was therefore decided to create a group "task sheet", on which the individual tasks were documented in detail.

When students actually started assessing the work of other students, they were very critical at first. In the end, the group performances were discussed and compared per criterion and the assessors took great care in assessing fairly and took the individual's backgrounds of experience in pronunciation into account.

Formative assessment: Due to time-constraints, less attention was being paid to formative assessment than would have been desirable. The formative assessment applied to the individual task only, but assessment criteria were composed together with the students and all students were familiar with them. Students discussed the asssessment criteria in their groups and especially with regard to the group task, often wondered and discussed how to meet the criteria and the strands involved best.

Learning: The unit on pronunciation, enunciation and the phonetic alphabet made students more aware of their own pronunciation and enunciation, of mispronounced words and seemed to develop an eagerness in them to improve. With the help of the iPads and the AE Sounds App the students were quickly able to distinguish between the phonemic symbols and learned to use them efficiently. This would not have been possible within the same amount of time with frontal instruction or with instruction without training equipment.

Questionnaire:

All 35 participants completed the evalutory questionnaire.
In this questionnaire, participants were asked after their experience with the diffent 'gateways' of personalised learning and the questions on the questionnaire were clustered according to these gateways.

Deep Learning - Assessment for learning

The aspect "Assessment for learning" was given an average 3.8 (100% response, 3 = neither disagree nor agree, 4 = agree) by the participants in answer to three specific questions regarding the use of formative assessment and knowledge about assessment criteria and two questions related to being informed about the expected outcomes in the tests (see figure 1).

Formative assessment took place for the individual test. 94% of students indicated that the formative assessment had made them aware of their own performance prior to the test (average score of 3.9).

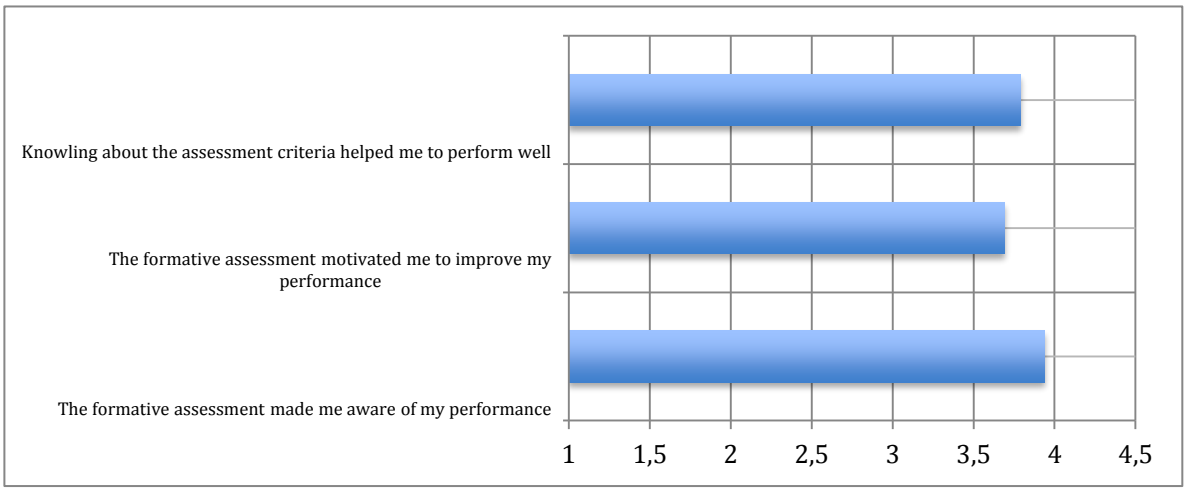

Figure 1: Students' average responses to the gateway 'Assessment for learning'

63% of students indicated that the formative assessment had motivated them to improve their performance (100% response) (average score of 3.7). To the statement "Knowing about the assessment criteria helped me to perform well." the students answered with an average 3.8 (100% response).

Student voice:

The aspect 'student voice' was given an average score of 3.94 in answer to three statements (see figure 2).

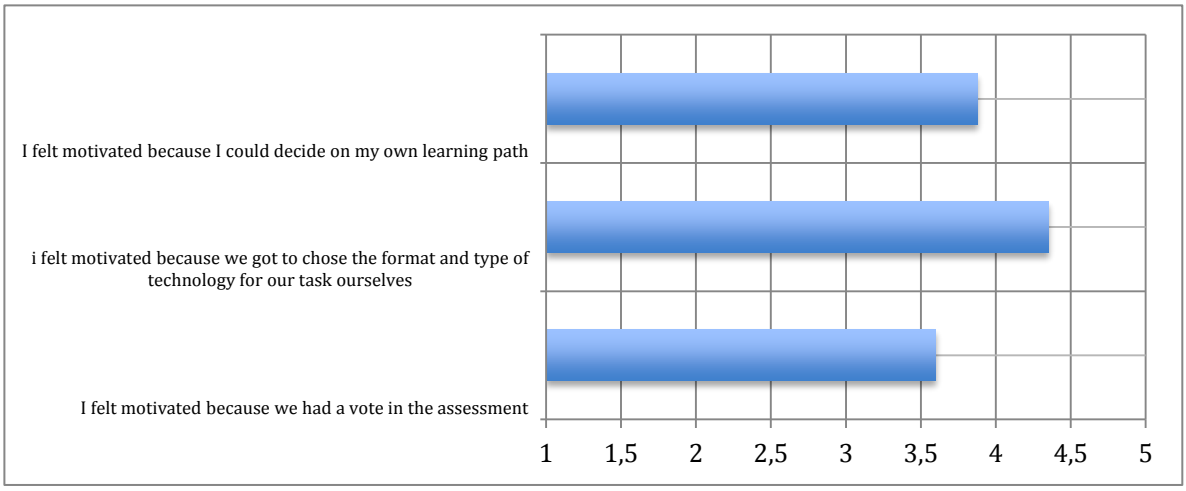

Figure 2: Students' average responses to the gateway 'Student Voice'

Students responded very positively to the rights or freedom of choice they had been given, whereby the freedom of choice seemed to weigh more heavily than the 'vote' in the assessment.

Interestingly, this average score of 3.9 on the aspect 'student voice' is comparable to the 3.8 in average of the 'Assessment for learning' -related questions. This confirms the findings of the SSat and ASCL groups on 'student voice' as one of the important 'gateways' to learning, apart from assessment for learning and others.

Deep Experience:

Curriculum: As far as the *learning experience* of this project was concerned, students reacted positively with an average score of 4.07 to three dedicated question, inquiring after their motivation by the group task. They felt challenged by the group task to perform well and indicated that they had felt motivated because the final task gave the unit a sense of purpose and made the topic more interesting. This seems to confirm the findings of Jones, Mc Lean, (2012) and (Hargreaves, Deep experience - 1, 2006).

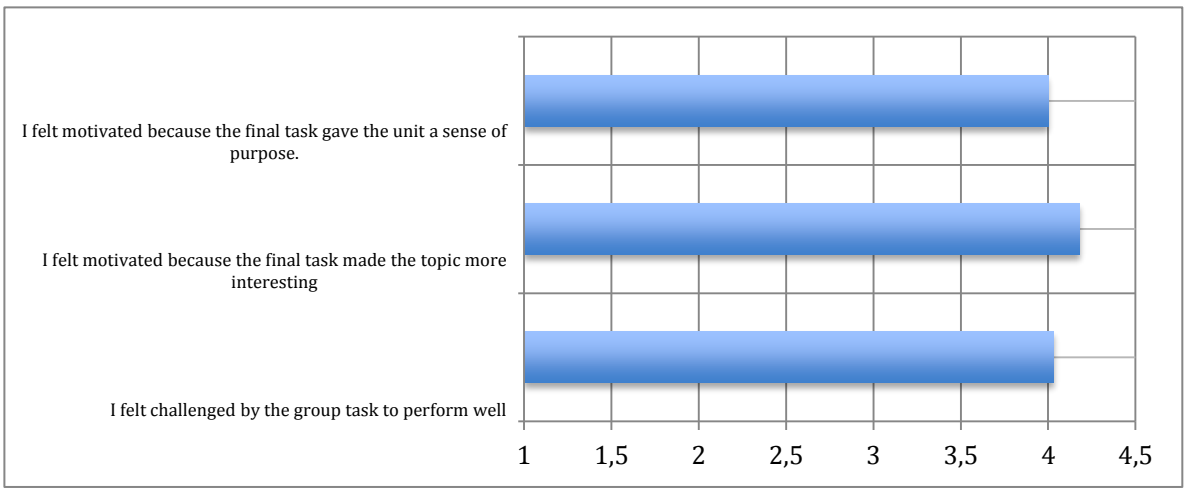

Figure 3: Students' average responses to Deep Experience - Curriculum gateway

ICT: When asked about their learning experience with ICT, students indicated with an average 4.06 that they felt motivated because they could chose their favourite technology for their final task, a score that could also be attributed both to 'student voice' and as such, should be disregarded because of its unclarity.

Regarding the use of the iPads students were very positive (100% response). A range of questions about their experience with the digital learning was asked. Only some of these enquired after their motivation and these are being used to come to an average score on the gateway 'Deep experience - ICT'. The average score in response to 4 questions (see figure 4) was 4.09, with the highest score of 4.49 awarded to the statement: "The digital learning on the iPad made learning more interesting to me" (100% response).

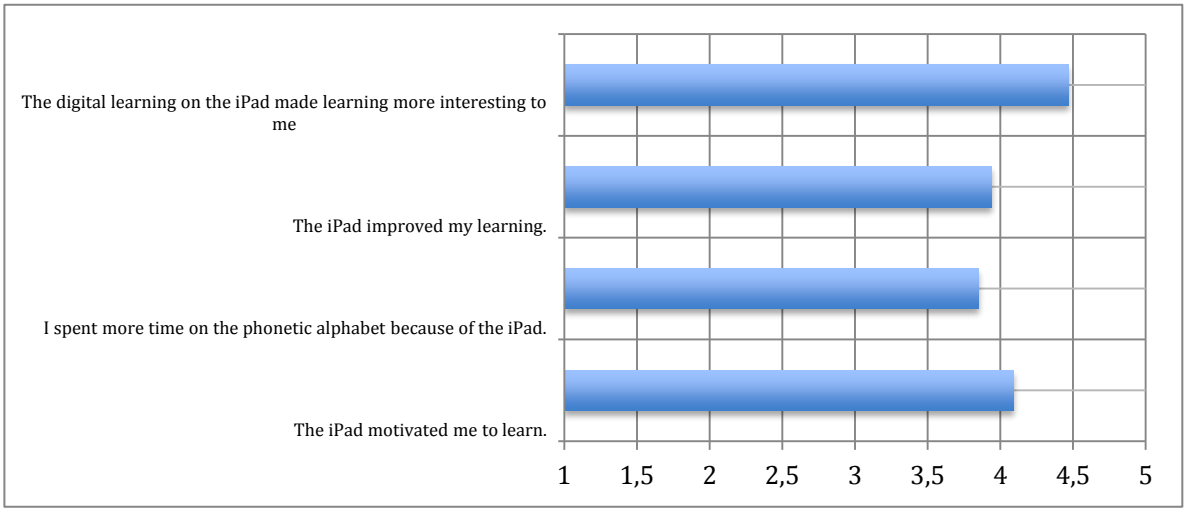

Figure 4: Students' average responses to Deep Experience - ICT gateway

86% of all students indicated that the iPads had motivated them to learn. The average score on this question was 4.09. Of the two students who responded negatively, one did indicate that he had spent more time on the phonetic alphabet because of the iPad and stated that it had improved his learning. The other student, extremely affected by a culture shock, thought the whole idea of the unit was "rather lame" and was extremely negative in most of his reponses. 80% of the respondents indicated that they had spent more time on the phonetic alphabet because of the iPad and 77% was certain that the iPad had improved their learning.

Students indicated with an average score of 3.85 that they had spent more time on the phonetic alphabet because of the iPad and with an average score of 3.94 that the iPad had improved their learning.

There was no direct correlation to be found between responses to the statement "The iPad has improved my learning" and students' performances in the individual task." Of the 25 students (71%) who responded with 'agree' or 'strongly agree', 8 scored lower than 50% on their individual test. With background knowledge of students' prior performance over the year these responses could be linked to the performance, but there was also the exception of a student who had achieved highest grades throughout the year and now seriously underperformed, but still indicated that the iPad had improved her learning. One student indicated with 'strongly disagree' that the iPad had not improved his learning and he did indeed achieve only 21% of the points in the individual test.

Furthermore, students indicated with an average 2.0 that the iPads had not distracted them, with a 4.17 that the iPad had been self-explanatory (there had been no explanation of how to use the iPad) and 86 % of the participants confirmed not to have had technical problems with the iPads. Of the 5 participants who indicated that they had met technical problems, 4 related these to the App Garageband; 1 participant related it to the use of the iPad itself, as opposed to the Windows equipment he was familiar with at home.

As far as the *learning experience* with the Macmillan AE Sounds Application was concerned, students were very positive, as indicated in Figure 5:

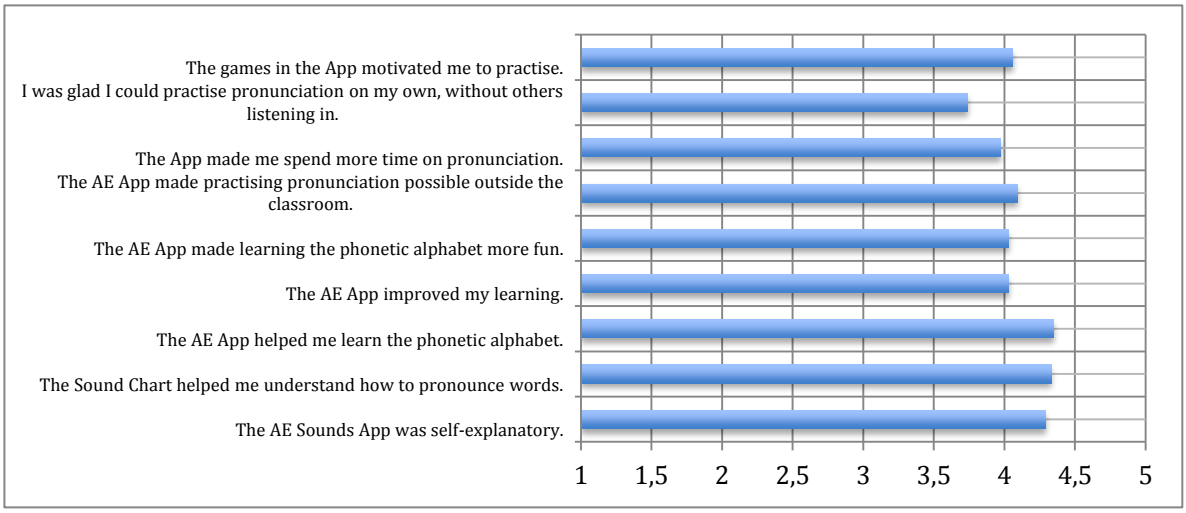

Figure 5: Students' average response
to statements regarding their learning experience with the AE Sounds Application.

The participants indicated with an average of more than 4.0, that the App motivated them to practise, made learning more fun and improved their learning. Considering the fact that the majority of students were pleased with their own pronunciation before they started on the project, the average of 3.97 confirming that the AE Sounds App had made them spend more time on their pronunciation, is astonishingly positive. This was confirmed by the teacher's observation that students were eager to check or adapt their own pronunciation or enunciation of words.

These positive responses also made it clear, that after an initial in-class instruction, the instruction can go on beyond the classroom and beyond scheduled lesson time, provided students are equipped with a tool that allows them to check their own performance. Personalisation of the learning of English pronunciation is enabled by the AE Sounds App and makes this highly recommendable, especially for Language B (language acquistion) and English support instruction and learning.

The teacher's observation that the male students seemed slightly more challenged by the games in the AE Sounds app than the female participants, was contradicted by their responses: 69 % of 13 male participants and 90 % of the 21 female participants indicated that the games motivated them to practise.

As far as the differentiation of learning was concerned, three questions were raised.

One investigated whether the students had been able to learn at an individual pace and one whether the iPad had enabled them to practise as much as they needed. 91% indicated that learning was enabled at an individual pace, the overall average score was 4.05. Especially in the light of the dire need for differentiation in learning at the international school, this can be seen as a great advantage.

57% of all respondents indicated that the iPad had enabled them to practise as much as needed. The overall average score was 3.55. The answer to this question was influenced by the fact that students did not find enough spare time to borrow the iPads. 69% of all students said that the iPad had enabled them to learn when it was convenient for them.

Deep Support and Guidance

The students indicated that the support from others in their task groups had benefitted them in positive answers to three statements, as indicated by figure 6, with an average score of 3.77.

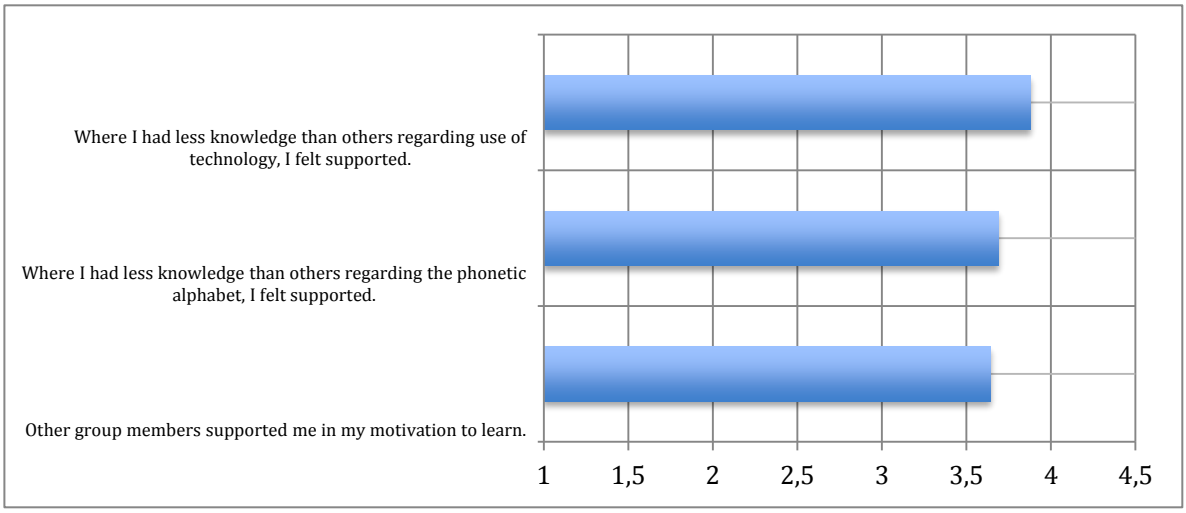

Figure 6: The average to the support within learning groups.

The questionnaire did not distinguish between the different roles in the learning groups and therefore the answers to the question investigating the support by the learning coaches in each group had to be disregarded.

Interestingly, students answered with an average score of 3.43 to the statement "The teacher guidance in class sessions was essential to my learning". This score is lower than the scores of respectively 3.65, 3.79 and 3.88 regarding the support by group members, as illustrated in figure 5 above. Within the project, the teaching role of the teacher was limited to an introduction to the phonemic chart and phonetic writing. Otherwise, the teacher

deliberately restricted herself to suggesting ways to learn and collaborate, to getting the groups to work, to providing information regarding the assessment, to the discussions with co-assessors, and other, organisational parts of the project.
In the open space available for extra comments regarding the support and guidance, students wrote positive comments, such as: "I received guidance when needed", "It helped me know what I should focus on", "I didn't really require support/guidance, but when I did, it was provided by my learning coach", "Having a group to ask for advice and opinions as well as motivation helped me". There were also more critical ones, such as one referring to the pronunciation/enunciation tasks: "Students are way too shy to tell each other what to do. Mistakes weren't corrected so no one's feelings would get hurt" or one referring to the teacher involvement "(...) a little more interaction from the teacher would greatly improve the process."
The students' responses seem to suggest, that the teacher's involvement can be limited, or rather, instruction continued beyond the classroom, provided the students have the direction, support and guidance they require.

Interviews (Appendix 4)
11 students were either interviewed or answered questions (see Appendix 4) that had been provided on their own. The questions focused on the main aspects of *deep learning* - personalisation of learning by means of the iPads and student voice - and *deep experience* - free choice of technology, free use of iPads and a final group task - as well as **deep support** - group support -. The interviews were intended to give further insight in the responses to questionnaire 2 and receive further, more detailed feedback from the students.

Question 1 asked them to compare the receiving of non-personalised tasks to the learning with personalised tasks. All interviewees responded positively, indicating primarily that the personalised learning had proved to be more effective. They especially highlighted, apart from a higher efficiency of learning, an increased level of personal motivation linked to the freedom to choose their individual learning paths and paces with statements like: "I personally believe it has an effect on personal knowledge and engagement" (interviewee 1), "it was more of a free feeling" (interviewee 3), "it got us to work on our own pace and motivated us to learn" (interviewee 4). Especially interesting in the light of differentiation for SEN students, was the reaction of interviewee 8, a dyslectic student, who stated "I found the phonetic alphabet very difficult to see the differences, so everything looked the

same and so, for me, being able to hear it was very helpful, because I'm able to then.... because like when you double-tap on a word you get a word in it so I wouldn't like really remember the symbols, but more the words, coz then the sounds would be in it (...) so I was able to do that, because you could personalise it."

Question 2 enquired after the students' perception of having a vote in the assessment criteria and in the assessment of the group task. The responses pointed in two directions. Firstly, all students indicated that they felt that student co-assessment had led to a legitimate, fair assessment and that it gave them a sense that their opinions counted. Being less relient on the teacher's grading gave them "A more comfortable one [feeling, of actually having the vote]. Most of all, more secure." (interviewee 4). Other responses were "(...) normally just the teacher gives you your grade back and now we sat down in a group and we talked about it, so then you also you feel that when the grades are given out, it's fair." (interviewee 8) or "it was the first time that we really got to have a say in how we feel we should be judged and I feel that with the assessment that we had, it was a legitimate assessment (...)"(interviewee 7). Other responses were "your opinion counts" (interviewee 4) or "it was good because our opinions could kind of be voiced" (interviewee 6). There was even one student who said: "it made me feel a lot more important". Most students linked the fairness of the assessment to the fact that the co-assessors had background knowledge on individuals' prior knowledge and proficiency in pronunciation.
Secondly, 5 out of the 11 respondents highlighted the fact that they had learned from the assessment, with statements such as "And probably something we did unconsciously, was actually learning from other people while assessing them" (interviewee 9) as well as the fact that the co-assesment had lead to a better understanding of the assessment criteria, as in "that [co-assessment] was very good because you know what is actually expected of you and more, like one of your group members was part of that or yourself, so they could tell you exactly what was waiting up so you could reach the higher grades (...) sometimes you don't really understand some strands [in a normal unit without co-assessors]" (interviewee 4).

Question 3 asked the students to weigh the different aspects. Aspects 1 and 3 were linked to *deep experience*, 2 and 4 provided more insight into *deep learning* and 5 was related to *deep support*. For the majority of students the personalised learning by means of iPads and the personal freedom involved, to decide on the learning process came first (4 *deep*

learning). The student voice - either with regard to the co-assessment (2 *deep learning*) or the freedom of choice regarding the type of technology (3 *deep experience*) - was also much appreciated by the students. Thirdly, the group support was highly recognized (5 *deep support*). One student expressed it like this; "It's really hard to say [which of these aspects was more important] because it was a combination, it is not just one specific thing that jumped out. (...) you know it was new, it was exciting for everybody because it was... obviously using the iPads is really exciting for everybody because it's the technology and everything and some people knew how to use it and some people didn't and obviously you need other group members so it was a combination of it all (...). She adds: "(...)you get this precious thing [iPad] that you know you have to be careful with and... I don't know. It was good!"

Conclusion

The results of this research sugggest that mobile tablet technology can act as an enabler of personalised learning, provided the appropriate learning tool, guidance and scaffolding are given but also make it clear that mobile computer technology is not a stand-along miracle of innovation.

It is especially the possible differentiation in learning pace and learning style (e.g. auditory vs visual) that is commended by students. For language acquisition the iPad with the appropriate Apps proves an excellent tool for language training through repetition, games inviting repeted practise and practise of pronunciation without feelings of inhibition. The research seems to suggest that, provided apps are chosen with great care and match or add to lesson content, students can revise on an individual basis and without extensive teacher supervision in their preferred learning style and pace.
In many cases, mobile computer technology will offer more possibilities for training/revision than conventional methods and appealed strongly to the participants at AIS.

As far as class use of mobile computer technology is concerned, it has become clear that the iPad is a tool that invites students to share thoughts and discuss lesson content in groups more than computers or frontal active boards and it is especially in this context, that the iPad offers more flexibility. Extensive teacher supervision and guidance is required to ensure that students use the tool efficiently in group work.

The iPads offer easy ways of recording, filming or taking pictures and as such can be seen as technical enhancement of in-class possibilities.

However, from the data gathered from the questionnaire, as well as from the more elaborate feedback in the interviews, it becomes clear that students valued other aspects highly as well, such as the *assessment for learning* with an average score of 3.8, *student voice* with a high average score of 3.94 as well as *deep experience* with scores around 4 for the final task and *support and guidance* with scores around 3.8.

The study seems to suggest that students felt motivated when they felt 'touched' or involved on an individual level in some way throughout the unit. For the dyslectic student it was the ability to personalise her learning to such an extent that she could actually learn the phonetic symbols in a different way. This was enabled by the iPads and this shows that the need for differentiation as such can be met with the relevant technology. This motivated her, together with the support from group members. This is supported by the data from questionnaire 2. For another student, it was the special role he could play in supporting others and the vote students were given; it made him feel 'more important'. Again, this is supported by the data on student voice in questionnaire 2. One student felt 'more comfortable and more secure' because of the co-assessment, another one felt that the freedom of choice of type of technology was most motivating. And the student with the culture-shock, who moved the Netherlands with his parents 6 months before, wasn't interested at all. All he wants is to go back to his home town.

These are examples to show that in order to 'touch' or reach the students so that they engage on a level of *deep learning*, more is necessary than the mere use of attractive tablet technology; it is the freedom of choice in learning, the freedom of choice in curriculum, the feeling that their voices are being heard, the sense of security from having a say in the assessment together with the use of modern technology, that triggers their motivation and enhances their learning.

If a permanent structural integation of mobile computer technology is desired at AIS, the organisational side needs to be carefully considered. It seems more advantageous to have students own the mobile tools or borrow them from school for a year. Although it is has become clear that having 'less than a class set' for in-class work invites collaboration and discussion among students, students would be able to use the tablets at home for revision and would be able to administer their own data such as presentations, films and recordings. An agreement on acceptable use in school should be drawn up in that case and school will have to guide and organise the choice and downloading of applicatons. When students are allowed access to a wireless network, tablets could also be used to search for information, but the temptation to visit their social networking sites will increase. Excellent examples of how to deal with this are available from several of the SSat schools (e.g. The de Ferrers Academy).

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Appendices

Appendix 1

Name: _____ Date: _____

Questionnaire:

Please indicate your thoughts on the following statements, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree	n/a
1. It will be easy for me to use the iPads	1	2	3	4	5	0
2. I am an experienced user of ICT	1	2	3	4	5	0
3. I am familiar with the phonetic alphabet	1	2	3	4	5	0
4. I enjoy working with ICT	1	2	3	4	5	0
5. I am able to look up the pronunciation of unfamiliar words in the dictionary	1	2	3	4	5	0
6. I feel confident about my pronunciation of English	1	2	3	4	5	0
7. Mispronouncing words in class is embarrassing	1	2	3	4	5	0
8. I feel insecure if I don't know how a word is pronounced	1	2	3	4	5	0

Please indicate whether you speak English at home:

yes / no / partly (specify: _____)

other: _____

Word list for audio-recording of student pronunciation

Name: _____ Recording nr.: _____

Instructions:

Pronounce the following words, enunciating clearly:

see egg cat sit away cut good her father two caught

on hear cure there ate boy my no now

pen five me bee very nine ten thing long do

this house chair so love just zoo right can she we

go vision yes

Pronounce the following words or phrases, enunciating clearly and stressing the right syllables:

accelerate	ambiguity	anticipate	momentarily
bearable	beneficial	capability	phenomenon
cumulative	deficiency	feminine	good-humoured
grown-up	hypothesis	inevitably	remote control

Teacher analysis:

Monothongs:

Dipthongs:

Consonants:

Stress:

Which role would you prefer in group work?

- creative director
- assessor
- learning coach
- technical director

Appendix 2

Questionnaire 2: Evaluating personalising learning

1. Please indicate whether you agree with the following statements on your *learning process* on a 1 to 5 scale, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree	n/a
a. The formative assessment made me aware of my performance	1	2	3	4	5	0
b. The formative assessment motivated me to improve my performance	1	2	3	4	5	0
c. I knew what was expected of me in the final (individual) test	1	2	3	4	5	0
d. I knew what was expected of me in the group task.	1	2	3	4	5	0
e. Knowing about the assessment criteria helped me to perform well	1	2	3	4	5	0
f. I felt motivated because we had a vote in the assessment	1	2	3	4	5	0
g. Because we co-decided on the assessment I felt the goal was attainable	1	2	3	4	5	0
h. Because students co-decided on the assessment I was discouraged to learn	1	2	3	4	5	0
i. I felt motivated because we got to chose the format and type of technology for our group task ourselves	1	2	3	4	5	0
j. I felt motivated because						

I could decide on my own learning path	1	2	3	4	5	0
k. Students with lesser pronunciation skills benefitted from more experienced speakers in their group	1	2	3	4	5	0
l. I felt challenged by the group task to perform well	1	2	3	4	5	0
m. It helps the group that students with lesser skills can practise outside class	1	2	3	4	5	0

What else should we know about your *learning process*?

_____
_____
_____
_____

2. Please indicate whether you agree with the following statements on *your learning experience* on a 1 to 5 scale, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	neither strongly disagree	disagree	disagree nor agree	agree	strongly agree	n/a
a. I felt motivated because the final task made the topic more interesting	1	2	3	4	5	0
b. I felt motivated because the final task gave the unit a sense of purpose	1	2	3	4	5	0
c. I felt motivated because we could chose our favourite technology	1	2	3	4	5	0
d. The digital learning on the iPad made learning more interesting to me	1	2	3	4	5	0

Is there anything else you'd like to tell us about your *general learning experience*?

_____
_____
_____
_____

3. Please indicate your thoughts on *your learning experience with* the AE Sounds Application and the Sound Chart on a 1 to 5 scale, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree	n/a
a. The AE Sounds App was self-explanatory	1	2	3	4	5	0
b. The Sound Chart helped me understand how to pronounce sounds	1	2	3	4	5	0
c. The AE Sounds App helped me learn the phonetic alphabet	1	2	3	4	5	0
d. The AE Sounds App improved my learning	1	2	3	4	5	0
e. The AE Sounds App made learning the phonetic alphabet more fun	1	2	3	4	5	0
f. The AE Sounds App made practising pronunciation possible outside the classroom	1	2	3	4	5	0
g. The App made me spend more time on pronunciation	1	2	3	4	5	0
h. I was glad I could practise pronunciation on my own, without others listening in.	1	2	3	4	5	0
i. The games in the App motivated me to practise	1	2	3	4	5	0

What else would you like to say about *your learning experience* with the AE Sounds Application and the Phonemic Chart?

_____

_____

_____

_____

4. Please indicate your thoughts on your *learning experience* with the iPad on a 1 to 5 scale, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree	n/a
a. It was easy for me to use the iPad	1	2	3	4	5	0
b. The iPad was self-explanatory	1	2	3	4	5	0
c. The iPad motivated me to learn	1	2	3	4	5	0
d. The iPad distracted me	1	2	3	4	5	0
e. I spent more time on the phonetic alphabet because of the iPad.	1	2	3	4	5	0
f. The iPad improved my learning	1	2	3	4	5	0
g. I'd rather use my mobile phone than a school iPad	1	2	3	4	5	0
h. The iPad enabled me to learn at an individual pace	1	2	3	4	5	0
i. I'd rather take the iPad home for practise	1	2	3	4	5	0
j. I had technical problems with the iPads	1	2	3	4	5	0
k. The iPad enabled me to practise as much as I needed	1	2	3	4	5	0

l. The ipad enabled me to practise when it was convenient for me	1	2	3	4	5	0

What else would you like to say about the use of the iPad?

_____

_____

_____

_____

5. Please indicate whether you disagree or disagree with the following statements on *support and guidance* within the project, by on a 1 to 5 scale, with 1 meaning you strongly disagree with the statement, and 5 meaning that you strongly agree:

	strongly disagree	disagree	neither disagree nor agree	agree	strongly agree	n/a
a. The teacher guidance in class sessions was essential to my learning	1	2	3	4	5	0
b. Other group members supported me in my motivation to learn	1	2	3	4	5	0
c. The learning coach supported me in the choice of a learning path	1	2	3	4	5	0
d. The group assessor supported me in directing my learning towards assessment	1	2	3	4	5	0
e. Where I had less knowledge than others regarding the phonetic alphabet, I felt supported	1	2	3	4	5	0
f. Where I had less knowledge than others regarding use of technology, I felt supported	1	2	3	4	5	0

What else would you like to say about the support/guidance you received?

_____

_____

_____

Appendix 3

Interview

Question 1:
During the research you were able to personalise your learning, which means you were able, by means of the iPads, to practise what you needed to as much as you needed to. How do you think this compares to receiving non-personalised tasks, e.g. tasks all students have to do, regardless of learning speed or prior knowledge?

Question 2:
During the project you had a vote in the assessment criteria and in the assessment of the group task. This is called 'student voice'.
Comment on how you perceive having a vote in the assessment.

Question 3:
During this project

1. you were set a group task to show what you had learned
2. you, or the group representative on you behalf, had a vote in the assessment
3. you were free to decide within a group on the type of technology for the final task
4. you were able to personalise your learning of the phonetic alphabet with the iPads, e.g. you could practise as much as you needed or wanted to.
5. you had support from the other group members

In comparison, how important or relevant do you consider these points to be, for your motivation and learning. Please explain.

Appendix 4

Interviewees 1 and 2 and interviewer

Interviewee 1 Maurits Seijger (MYP5)

Q1. Well, I personally believe it has an effect on personal knowledge and engagement compared to what other students know allowing you to really, you know, decide as how much much you want to learn and it really makes it easier without specific tasks, you know, where everybody can exchange answers without people actually learning it.

Q2. Well, unfortunately, I was not the co-assessor in my group... regardless, I believe that giving the students an opportunity to vote on the assessment criteria and giving the opportunity to actually have a say in what the grade is, takes more of the student's opinion and their personal learning experience into account and thus, is overall better, for the other students [the non-assessors] score higher and learn more from the experience as a whole.

Q3. Well, personally, I find that allowing students to personally choose how they learn something is much more effective as well as giving them total full creative freedom over personal group tasks is always more fun and thus motivates them more to actually deliver something good on time.

Interviewee 2 Basel Ahmed (MYP5)

Q1. I think it is good because some students might be quicker learning other things than others and some people might know on the other hand some people might know less and are slower in learning so that you can step away from the group and learn on your own and practise.

Q2. I thought it was a nice idea mainly because students barely... don't ever have a voice or anything to say. It is ...this is so in a way[inaudible] that you can see from the students' points of view that you can always see how it is harder for one student than for another. They can just tell it by grades that this one is better than the other, instead of actually getting what is different or what is the problem. And by doing so, you find out the reason why they aren't as good as the others.

Interviewer: "Are you saying, that if students get to co-assess, that they take into account the background they know of the others"

Interviewee 2: "Basically, if you are in a group with someone and then the co-assessors, they know how good you are or how bad you are in some things and then...

Interviewer: "Are you referring to the pronunciation know? So that you knew some people were fluent already where others had to learn only a couple of things and...

Interviewee 2: "Yeah, I had to eh, I needed more time for my enunciating and eh.. my assessor in my group, eh Sharanya, eh she knew that and I guess because she knew that she could take that into consideration on the assessement and then, with the teacher, she could talk about that and then, maybe, give you more harsh or less harsh on... grading me down or up."

Interviewer: "Ok, so you think that this would also personalise the assessment in a way."

Interviewee 2: "Yeah, more..... than overall assessment."

[Interviewer explaining question 3]

Interviewee 2: "What helped me most is, I guess, the fourth one, where I had time with the iPads to practise by myself, eh... it doesn't help if I sit in a group and I practise with the rest of us; I might be better at things more than they or they might be better and that wouldn't help either of us. So, it was handy to have an iPad for myself to practise eh.. on my own, basically."

Interviewer: "Right, so that was very supportive. Is there anything else that you find worthwhile?"

Interviewee 2: "Eh... the last one, with the support of other members...[inaudible] ... people could help each other, which was a good idea ... eh... it's always nice to have someone there to help you.

It's not as important as the other one we discussed before [personalised learning] but it is good to have someone there to help you practise."

Interviewer: "So, you mean somebody, other than the teacher?"

Interviewee 2: "Other than the teacher, yeah."

Interviewer: "Would you, would you eh... sooner ask a group member, would you feel more comfortable asking a group member quickly rather than asking the teacher?"

Interviewee 2: "Yes, mainly because it's all students.. it's always like this... but you think about it students and teachers...you have like the barrier between the two people.. and other students you don't, because they are friends. So, it's just a little different."

Interviewer: "It's easier?"

Interviewee 2: [inaudible] yes.

Interviewer: "How about this final task that you had to accomplish?

Interviewee 2: "Eh, the final task was a bit of a hassle, wasn't really that big of a problem, but it was, because people had to write their own .... because we were writing a news report but then on a website, so we had to have script that you can type and then we also had to have audio and audio was more of a hassle than script ."

Interviewer: "Ok, but the fact that you, as a group, had to accomplish a final task, that this was at the end of the unit, what did you think of that?"

Interviewee 2: Oh, it was a good idea, because you can see that ... eh.. you can look back at yourself to see how you have improved, because know how good they are in the beginning and then after that you [inaudible] your task together, you always have your individual things you need to do and if you look back at yourself, you can see what you improved in and how much you improved.."

Interviewer: "Did that push you to improve your .... what you learned? eh.. Did it motivate you to learn?"

Interviewee 2: "Eh, in a way, yes, because then you know you need to do better and you want to do better because you are going to get assessed on the last one, because it's important to you, you want to get a better grade so you feel like you need to do better on the way to the last point."

Interviewer: "All right. Now, so the student vote, eh, so the second one, where would you put this if you said eh... the iPads and the personalised learning is most important, among these 5, where would you put the student voice; least important, or somewhere in the middle?"

Interviewee 2: "Either in the middle or right after the iPads, because I really think it's a really good idea that a student gets to say something, because teachers do not always hear ..... students don't always tell teachers if is a problem, I don't if they are scared or they are shy or they don't feel like the teacher needs to know, but on the other hand, it's always good to have someone there to speak for you."

Interviewer: "All right, very interesting, thank you very much."

Interviewee 4 and 4 and interviewer

Interviewee 3 Anton de Water (MYP5)

Q1.: In comparison to normal tasks, where the teacher would hand us out sheets and we wouldn't really have the choice what we wanted to do, the iPads were actually a solution for that, because we got to focus more on what we wanted to do and we were motivated with the iPads and it was more a situation of that we could do what we wanted to do.

Q2. I think the vote in the assessment actually helped... [something going wrong with recording] what the criteria would be on and seeing as it was our project we got to choose that ourselves and got to comment on one another's jobs within the iPad work.

Q3. In comparison to the normal assignments, this assignment really motivated us and there was much more learning involved especially when we were doing the phonetic alphabet and worked with each other as the team members because you really got to show your part of the group task in a way that you wanted to and having fun working with the iPad.

Interviewee 4 Pol Vassart (MYP5)

Q1. I think it was a good idea to work with the iPad because you could work at your own pace and yeah, it's like more fun if you do what you want to do instead of the teacher telling you what to do, so it was more motivating and I learned more out of it.

Q2. Having a vote in the assessment was really good coz we could choose on the criteria so exactly knew what like what to do and what was expected of us.

Q3. I think that working with the iPads was relevant and important because it got us to work in our own pace and motivated us to learn and we could do whatever we wanted to do and learning the phonetic alphabet was easier using the iPads because we could really work throughout the period of what we wanted to do.

Interviewer [following up on the students' response to the three questions]: "Ok, so question 3, what does it mean to you, Anton, which of the 5 is most important?"

Interviewee 3: "I think most important was probably that you were able to personalise your learning of the phonetic alphabet with the iPad and you could practise as much as you needed coz it was more of a free feeling... ehm.. so it was more like you had everything that you needed, you didn't have to constantly ask the teacher ' is this correct' ... you had the system and everything was pretty much clear; the task was set for you. There wasn't any questions needed."

Interviewer: "Did you ever experience that you were in a class where others are far better than you and you just can't catch up or the other way round, where you are bored because everybody else can't catch up?"

Interviewee 3: "I think it was perfect, actually, that everybody was focusing on the same thing, nobody was ahead of one another, except maybe in the group task, because we had different things assigned but all in all...

Interviewer: "So you did not really personalise your learning?"

Interviewe 3: "It was personalised, but it wasn't like I had to catch up with people or constantly ...."

Interviewer: "Ok, so you just did what you thought was necessary to achieve the same task at your own speed"

Interviewee 3: "yeah"

Interviewer: "Did you do it at your own speed?"

Interviewee 3: "yeah, it was"

Interviewer: "Or you took the exercises you preferred?"

Interviewee 3: "Well, a mix of both, it was at my own pace but when I think I needed practise, I used the system, the App to use time to exercise."

Interviewer: "Eh.. if you could mention... eh, which one would you see as next, eh, as almost as important as the personalised learning, is there anything you would...?"

Interviewee 3: "Eh, probably 3, that you were free to decide within your group on a type of technology for the final task, which was also more of a freer feeling and eh.. that you got to do what you wanted to learn or wanted to present."

Interviewer: "And how did this work out in your group?"

Interviewee 3: "It worked out fine, actually..."

Interviewer: "Did you have more fun doing the group task because of the freedom of choice?"

Interviewee 3: "Yeah, of course. Coz it was just you and your group and you were doing what you wanted to do and it was still the correct thing. It was kind of good feeling."

Interviewer: "So it that more or less important than the iPads?"

Interviewee 3: "I think the iPads was great, but like until that time that iPads would be constantly used, 3 would be more of an important thing that you are freer within group tasks and that even though it is something different it is still the correct thing."

Interviewer: "What about the student voice? Do you think that.. after all you get to co-assess, so is that merely a chance for a higher grade or is that eh, Pol, what do you think about that?"

Interviewee 4: "Eh, I thought that that was very good because you know what is actually expected of you and more, like one of your group members was part of that or yourself, so they could tell you exactly what was waiting up so you could reach the higher grades. "

Interviewer: "So how is that different then, or is that different from a normal unit, where you get assessment criteria, because you always get the assessment criteria or rubrics?"

Interviewee 4: "Sometimes you don't really understand some strands, so that is hard to reach the strands, the maximum level for that so and here, if you can understand all the strands you can easily reach the higher levels."

Interviewer: "Because you're... because the co-assessor in your group can explain, or?"

Interviewee 4: "Yeah."

Interviewer: " And, and what about the feeling, apart from the assessment criteria, of actually having the vote? What did you think of that, was that a good idea?"

Interviewee 4: "A more comfortable one. Most of all, more secure."

Interviewer: "More secure? That's interesting, what about you, Anton, what would you say?"

Interviewee 3: "Yeah, the same, it was more, more secure probably and comfortable as well."

Interviewer: "Comfortable in a sense that you are not just relient on what the teacher thinks?"

Interviewee 3: "No, yeah, it's more you know that your opinion counts."

Interviewer: "Ok, and do you think that this is a fairer way?"

Interviewee 3: "Eh, yeah - Interviewee 4 "yeah" - I think so yeah."

Interviewer: "Ok, did you try to discuss with your co-assessors a bit in your group?"

Interviewee 3: " Yeah, that's another good thing, that you could constantly have a conversation with your group members or co-assessors whether they think it is right... it's really group work."

Interviewer: "[to interviewee 4] Do you agree on that?"

Interviewee 4: "Yeah, I agree."

Interviewer: "Pol, if you look at question no. 3 what was most important to you?"

Interviewee 4: "I think that it is number 2, that you had a vote in the assessment."

Interviewer: "yeah?"

Interviewee 4: "yeah"

Interviewer: "So that was more important than the personalised learning?"

Interviewee 4: "yeah, kind of"

Interviewer: "kind of.."

Interviewee 4: "yeah"

Interviewer: "yeah, ok, interesting to hear, because it gave you this sense of security, and democracy, maybe, really, is that it?"

Interviewee 4: "yeah, that's it."

Interviewer: "What would you point out as second important, to you?"

Interviewee 4: "Personalisation of learning"

Interviewer: "personalised learning?"

Interviewee 4: "Yeah, personalised learning, so with the iPads"

Interviewer: "Is there another one that you thought was important?"

Interviewee 4: Well, also support from other group members."

Interviewer: "Yeah?"

Interviewee 4: "Yeah, so you're not only motivating yourself, but also your group members and if you don't understand, you can always ask them to explain something."

Interviewer: "[to Anton] Would that be your third as well?"

Interviewee 3: "Yeah, that would be my third as well."

Interviewer: "thank you very much, gentlemen."

Interviewee 5 and 6 (no interviewer)

Interviewee 5 Sophie van der Hoeven (MYP5)

Q1. I think that it is more effective if you're able to practise the things that you need to practise, then you get that tasks from.. that all the students have then it's harder to - like - keep up for some people, so I think that it's more important that you have what you have [inaudible](..)

Q2. I think it was good [to have a student assessor] because you have more people who kind of understand the situation and they -like- understand how difficult it could be or how easy it could be, like depending on what they chose to do [referring to group task]. So I think that it's a very good idea and that it should be done -like- more often

Interviewee 5: "And what do you think of it, Epiphany?"

Interviewee 6 on Q2. "I think it is a good idea because they understood the situations that us students were put in, so they could -like- say 'oh this person did better' like or 'this person did good in that aspect because it was actually, yeah, that was like a hard topic to do but they actually did well on it' or they could say like 'that was like kind of easy' like assessment rubric thing, maybe they should be graded down for it because they actually didn't do well in it."

Interviewee 5 [changing the nature of questions 3]: "How important did you think it was to be working in a group and have -like- a group task?"

Interviewee 6 [answering to that question]: "Ehm.. I think it was good because yeah we had a group that could -like- motivate us and -like- help us learn other stuff so they could be -like- 'Oh, I think you need to focus more on that' which was good to have like other people there that.."

Interviewee 5: "Yeah, we also had a learning coach which would -like- help anyone if they were -like- in trouble or -like- in doubt"

Interviewee 6: "Yeah"

Interviewee 5: "or want to do [inaudible].. like keep up"

Interviewee 6: "Yeah"

Interviewee 6: "yeah, it was good that we were like split up into different members of the [giggles] to eh yeah...

Interviewee 5: "And if one person wasn't able to keep up, then we would -like- stop and we'd explain it .. make sure that everyone knows what's going on."

Interviewee 6: "so, we felt more involved and motivated to continue our assessment and our project."

Interviewee 5 [deviating from the questions]: "Did you like using the phonetic..."

Interviewee 6: "phonetic alphabet?"

Interviewee 5: "Yeah, the phonetic alphabet." [referring to the AE Sounds app]

Interviewee 6: " Oh yeah, I thought that was helpful because it's more in-depth to the English language which is what this subject is, so we could learn more about that. And you?"

Interviewee 5: "yeah, I thought it was good also with the use of the iPads, that we were able to -like- hear the sounds and how it is supposed to be..."

Interviewee 6: "Yeah"

Interviewee 5: "So we could practise and then if there was -like- one specific sound or letter that we couldn't pronounce well, we could practise it in our own time as well, like we would take an iPad and go into the B10 [studying area] and we'd be able to practise. So I thought it was very effective."

Interviewee 6: "We also were able to decide, like freely, on what type of technology we were allowed to use for the final task, which was a good decision because we weren't -like- just subjected to one type of technology, we could like chose, we could chose whatever we wanted, so like we ..."

Interviewee 5: "We were able to do what we thought would suit our task best and we were all able to agree on something, so everyone was pleased.."

Interviewee 6: "Everyone was, yeah, and it motivated us more that we could just -yeah- do our own thing."

Interviewee 5: "And what did you think of having a vote in the assessment?"

Interviewee 6: "We already talked about but yeah, it was good because our opinions could kind of be voiced, and our..."

Interviewee 5: "We could say what we thought.."

Interviewee 6: "Yeah, we could say what we thought about the assessment and..

Interviewee 5 : "We thought it was a very nice"

Interviewee 6: "it was a good, nice, it was a nice research project and"

Interviewee 5: "I would definitely recommend it to the following classes"

Interviewee 6: "Yeah, really, the next classes should definitely do it"

Interviewee 5: "And also, I would make sure that students are able to use the iPads more often, because that makes it -like- so much more easy to learn."

Interviewee 7 Lotte Somsen (DP1) and interviewer

Interviewer: "So, Lotte, your ideas about the non-personalised tasks?"

Interviewee 7: "Well, I think that the iPad was quite a good tool, because, I mean, they were always there, so whenever I wanted to or if I had a free period, you know, my own time-line, I could go and get it..."

Interviewer: "Lotte, the question refers more to the idea, you know, the contrast between being set a non-personalised task - you know that the teacher decides on your learning steps and this is the final task and you all have to do these excercises - whereas now 'this is the final task' and here's a tool to practise with as much as you want or need."

Interviewee 7: "Yeah. Ehm.. I think that it is different for each student, but personally, I sometimes do need deadlines or reminders to do certain things, but I feel that with the task we did it fitted quite well, but there might be other tasks, like larger assessments or langer tests where it would be good to have someone look into what you have done so far, instead of leaving it completely to the student itself, ehm.. but it also depends on the student, I feel like in DP1 you're already quite an individual where you are preparing to go to university where you're not going to have someone chasing you all the time, so I feel like it is a good step to teach people ..

Interviewer: "Yeah, but listen, there was a teacher there supervising whether you were busy, so that was not.. you weren't left competely alone..."

Interviewee 7: "No, but..

Interviewer: "You weren't just given a pad and told 'go home and practise yes or no. The question was - once again I'd like to point out - the question is' how that compared for you to have a task where you could decide what you were going to practise to achieve the things that had to be met or the other variety that we see in instruction, where you get to do the same exercises as everybody else, regardless of whether you need those exercises or not."

Interviewee 7: "So, basically having the choice yourself of what you're going to learn."

Interviewer: "hmm, or what you're going to practise"

Interviewee 7: "What you're going to practise.. well, that for me like I feel that that is quite good, I feel that that is the right approach; instead of wasting your time doing something that you already feel you don't need to spend time on, whilst you could be doing something that you do need to spend time on. And, so that you can involve in the subject or part that you do need".

Interviewer: "Ok, question 2, I think you were a co-assessor, weren't you?"

Interviewee 7: "Yeah."

Interviewer: "Ok, so what do you feel about having a vote in the assessment?"

Interviewee 7: "It was different, it was the first time that we really got to have a say in how we feel we should be judged which I feel is quite good, because, you know, students and teachers look at different things and I feel that with the assessment that we had, it was a legitimate assessment, it wasn't something that was easy, it was still challenging for everybody; everybody was at different levels, but it was.. it fitted each student, which I thought was quite good, instead of having a certain assessment that maybe was too challenging. So I thought it was good.. and I liked it or something. hihi."

Interviewer: "Oh yes.. [laughs] ok, nice, but in fact you were stricter than... you know in the beginning you were very very strict and I thought .. hmm ok, how am I going to solve that. And you were very concerned about the fairness, weren't you?"

Interviewee 7: "The fairness, yeah, you know, other people put in more effort than others and that's hard to assess but I did feel like this assessment did."

Interviewer: "Yeah, ok. So, if you compare - lists the aspects under q3 - how would you want to weigh that, which one would be the most important for you?"

Interviewee 7: "Well, I have to read it again... I feel that it was important that we were able to show what we learned, because eventually that is your goal, to show what you have learned.. but in this specific task, I think .... it's really hard to say because in was a combination, it is not just one specific thing that jumped out. I think it was a combination that made the project so..... you know it was new, it was exciting for everybody because it was ... obviously using the iPads is really exciting for everybody because it's the technology and everything and some people knew how to use it and some people didn't and obviously you need your other group members so it was a combination of it all, but I think that if we didn't have the iPad, people probably wouldn't have put in as much effort because if you just get an internet website with you know you click on, it's hard to find it more exciting to learn it, because then it's just another website you're doing, so I feel the iPad was an element that made the project more fun for everybody and made it more serious, because you get this precious thing that you know you have to be careful with and I don't know. It was good!"

Interviewer: "All right, thank you very much."

Interviewee 8 Saskia van Dongen (DP1) and interviewer

Interviewee 8: Q1: I found it very helpful, coz you basically you were shown what you needed to improve in and then by being able to personalize it, you were able to see your progress and actually get there in an easier way than when it was more general, because then you'd have to adapt that into a way so that you could actually move forward. So I think that the personalisation for me was very helpful. Coz I could see where I was, I could see what I was doing, I could see what I needed to do and how, and like we were also given the iPads and stuff, so I could actually well, I had that help to get me also there. So I think the personalisation was very suitable.."

Interviewer: "You're also a dyslectic student, aren't you?"

Interviewee 8: "Yeah"

Interviewer: "How was that - did this mean anything in particular for you, in relation to that?"

Interviewee 8: "Ehm.. why I found the phonetic alphabet very difficult to see the differences... so everything looked the same and so, for me, being able to hear it was very helpful, because I'm able to then.. because like when you double-tap on a word you get a word in it so I wouldn't like really remember the symbols, but more the words, coz then the sound would be in it. So in that way..

Interviewer: "And with all the teacher's explanation with all the gestures to the sounds you could memorise them?" [the teacher had followed Adrian Underhill's explanation on how to teach the phonemes]

Interviewee 8: "Yeah, so I remembered that, like, with the mouth like sounds in the word, not so much the symbols, like for me, so I was able to do that, because you could personalise it."

Interviewer: "Nice! Now as to the second question; you were a co-assessor, what did you think about giving students a vote?"

Interviewee 8: "I think it is good, it also makes ... more clarity in a way."

Interviewer: "How was it to you, personally?"

Interviewee 8: "It makes you feel noticed, in a way, that you can assess it and even if you are not on that level, you are still able to overlook everything that was good and what was not... disregarding

[regardless of] how well I could speak it, for example. So, it kind of like gives you that extra bit of confidence in a way and disregarding [regardless of] what level you are on, you know what is right and what is wrong and what is expected and you can still see what it is what you need to do and that also gives you that bit of confidence in making your task, because you then know what is expected and stuff and you can get as close to that as possible. So I think that by doing it individual with students, so for example that I had a voice, I found that I knew, I clearly knew what was expected in that way and I also knew that I could rely on myself to going back to that, because I knew what it was.

Interviewer: "And you also felt 'heard', you said?"

Interviewee: "Yeah, eh, so I think sometimes, like normally just the teacher gives you your grade back and now we sat down in a group and we talked about it, so then you also you feel that when the grades are given out, it's fair.

Interviewer: "Fair.. allright."

Interviewee: "Fair, yeah, because you kind of know what's coming."

Interviewer: "Did you also feel more comfortable?"

Interviewee 8: " Eh...

Interviewer: "So, in a way, less relient on the teacher's assessment?"

Interviewee 8: "Well, I found that at the beginning I felt .. actually I was a bit uncomfortable [at the first co-assessors' and teacher's discussion] and I was a bit scared of what to say and how others would react to it."

Interviewer: "When we were discussing the criteria, you mean?"

Interviewee 8: "Yeah, you didn't quite know what to say, you didn't want to say something really stupid, that's what you worry about and I think that when sort of when I realised that, it like that would everyone would say would be appropriate, that you then started to feel more self-confident, in that way."

Interviewer: "Ok. But also, did you feel more comfortable, regarding the assessment and the end of the task."

Interviewee 8: Eh.. yes and no, like yes, because I knew the thinking process that went through it, but in a way I also trust you with how you see it and stuff. In that way I trust both ways in what comes out of it."

Interviewer: "Ok. thank you. Question 3 asks you to sort of weigh these different things. Which one would be most important?"

Interviewee 8: "Eh.. I would say 4 and 5."

Interviewer: "so, the personalisation of learning and the support from other group members.... so not the 'vote'? The 'vote' is less important than the support of group members? Is that what you think?"

Interviewee 8: "Yeah, because I found that I would have not been able to get to the level that I got to, without for example Daniel [interviewee 9] helping me pronouncing these words. So in that way, I was able to get there because he was also willing to help me. So in that way, I found that very important.

Interviewer: "oh, allright. Did you feel that you have now improved your pronunciation on the long term?"

Interviewee 8: "You become more aware.."

Interviewer: "More aware... confident also, or?"

Interviewee 8: "Em.. I think that the thing is, that in a way, it doesn't change my confidence that much, because I wasn't aware of what I'm doing [in pronouncing English] because you don't walk around with a microphone and hear everything you say, so that when it does happen, then you hear it and because then we had the project where you're were supposed to improve it, and you try to get as close to that level as possible, that then your confidence kind of stays the same way, because first you didn't know it but now you do, but now you've improved in it.

Interviewer: "so, yeah, all right"

Interviewer: "Do you think it's a unit worthwhile to repeat, I mean it was done for a research project, do you think it is worthwhile to repeat in DP1, start them off with phonetics and pronunciation?"

Interviewee 8: "I think it is, I think it is useful and helpful. I think it also helps in a way, because of the personalisation, it gives the person .. like.. they have to take, they have to do it, so then they're also forced to -like- count on themselves and rely on themselves so then you really have to trust what you're doing, because there's not specific guidelines, so I think that also helps you."

Interviewer: "What grade did you get, in the end?"

Interviewee 8: "Em... I got a 6."

Interviewer: "A 6 out of 7.

Interviewee 8: "Yeah, I was very surprised."

Interviewer: "It's amazing for a dyslectic person, who says she can't read or write the symbols, eh? So that was well-done. Ok. Thank you very much."

Interviewee 9 Daniel Obubo (DP1) and 10 Tim van de Star (DP1) and interviewer

Interviewer: "So, Tim, the first question, the personalised vs non-personalised.."

Interviewee 10: "I liked that it was personalised as I did chose how I could study and thus parts of the language which I was like you know on the spelling of the phonetic alphabet I was a bit .. I could study more on that ... and that was what I liked, with the iPads, yeah, it helped a lot."

Interviewer: "And if you compare that to sort of regular teaching, let's call it regular teaching.."

Interviewee 10: "Makes it more fun."

Interviewer: "Makes it more fun?"

Interviewee 10: "yeah, and, like, you want to study more, instead of the normal tasks, which I find less interesting."

Interviewee 10: " So that's more..... eh do you have the experience where you are bored because you have to wait till others have reached that level of learning, or maybe the reverse, that you can't catch up on things?"

Interviewee 10: "yeah, yeah."

Interviewer: "What about you Daniel, what did you think?"

Interviewee 9: "What I thought about it was, it made learning a lot more interesting, like since then, but it also really helped us, because in all our different groups, we were put with people who were probably more advanced than others in pronunciation but with that kind of personal touch to it, we could help each other in a way that normal learning might not be able to have done and so with the help of the iPads and the Apps that we used I was able to -like- support other people that perhaps their pronunciation wasn't the best, but I could also help them with my knowledge of pronunciation and with that form of learning I think was interesting."

Interviewer: "Ok.What about you learning the phonetic alphabet, because that was your individual task, so how about the learning there?"

Interviewee 9: "That was also better, I think, because of having a classroom where we would all have to be taught the phonetic alphabet, this was a lot more personalised so you did it on your own pace, instead of even having to wait for somebody or not being able to catch up to another person's level. It was all done at your own pace. This is why because using the iPads and using it with your groups is a lot better than just ordinary learning."

Interviewer: "Were you a co-assessor, Daniel?"

Interviewee 9: "I was not a co-assessor."

Interviewer: "Ok. But, you had a co-assessor in your team?"

Interviewee 9: "Yes"

Interviewer: "Ok. What did you think of this idea of giving students a vote. What did it mean to you, to you personally, what did it mean to you, how did it make you feel?"

Interviewee 9: "It made me feel a lot more important. Because we were all given our different tasks in our group of what we were going to do and the co-assessor made you look into what other people did more critically and so you were looking at the different aspects that they wer edoing in their presentations as a group and you were thinking, did they do that well, and all that. And probably something we did unconsciously, was actually learning from other people, while assessing them and so yeah I think, the student co-assessor is a good idea."

Interviewer: "Did it make you feel more comfortable, in a way, I mean, in a sense of being less relient on the teacher's .. sort of ...'verdict' if you like."

Interviewee 9: "'Verdict' hihi. It did make us feel a lot more comfortable and confident, because we knew that... well, sometimes, a teacher's verdict can be down to what a teacher likes or dislikes but then with an entire group giving feedback we could all find a balanced idea where you were grade-wise."

Interviewer: "Do you see that similarly, Tim?"

Interviewee 10: Yeah, I mean everybody gets a vote, so it's not just the teacher who decides on whether it's good or bad, as Daniel was saying, but all the assessors would..

Interviewer: "What did this do to you personally, did it make you feel more comfortable, or?"

Interviewee 10: "yeah, I knew more what was expected of me, as the criteria were set by the assessors, and they were [inaudible]-ly given to us and so I knew what was expected and it made it easier to reach the end-goal."

Interviewer: "Ok, now, ehm.. as to question 3, Daniel, question 3 asks you to sort of weigh which of these aspects, the 5 aspects, either the group task, or that you a had a vote, or the free choice of technology or the personalised learning or the support of other group members... if you were asked to weigh these, which ones would you say were more important to you, to you personally?"

Interviewee 9: "To me personally, the most important would be- well I think 5 and 1 go together, the fact that it was set as a group task to show what we've learned and the fact that with 5 especially you had to support other group members, I think those were the most important in the ..

Interviewer: "Even though, pronunciation-wise, you were the best of your group."

Interviewee 9: "Oh, yes, but that was the reason why I really liked to support them, to be able to help other people."

Interviewer: "Ok, and what about your individual task, then?"

Interviewee 9: "Individual task... then that;s where number 4 comes in, about the personalised learning."

Interviewer: "So it's for you on the whole, if I summarise correctly and please correct me if I'm wrong... it's more the group work and the individual pace of learning enabled by the iPad rather than the vote?

Interviewee: "yeah, it was rather than the vote, coz yeah, it is just the way I feel, really.. coz I"

Interviewer: "It's ok, yeah, it's ok! It's your opinion! Tim, how about you, how would you weigh them"

Interviewee 10: "4 as the most important to be able to personalise your learning, with the phonetic alphabet with the iPads as I could go, I could choose my own pace on how to work and as I said, you don't have to wait for everybody to catch up or I had to catch up. And number 1 was really important, that we were set a group task. So, we could show how much we'd learned.

Interviewer: "Did this motivate you to perform better?"

Interviewee 10: "Yeah, as a group we could make a better group task and yeah, we could show the rest of the class how far we had come."

Interviewer: "Did you agree with Daniel, that you learned from each other?"

Interviewee 10: "Yeah, everybody gave each other tips on how to pronounce better if they were mispronouncing a word or something.. em, yeah, and we could really show off how much we'd learned with the language use."

Interviewer: "Is there anything else you would like to say as feedback?"

Interviewee 9: "I think we've covered nearly everything I thought about regarding this project."

Interviewee 10: "yeah"

Interviewer: "Thank you very much then, that would be all, thank you."

Interviewee 12 Arnav Mundkur (DP1) and interviewer

Interviewer explains question 1 -

Interviewee 12: Well, it was better to do it personalised, so not only were we in charge of our own learning, but we could go at our own speed. Because then for some sections like, maybe, I could go faster with like spelling the words in the phonetic alphabet I could do relatively faster than learning the phonetic alphabet itself, so.."

Interviewer: "79 % score I heard across the classroom, [laughs] so you made it into a little competition."

Interviewee 12: "[laughs] If I had to do a non-personalised task, then if I , if I wanted to, if I wasn't able to learn for example the phonetic alphabet in the time that we were given, then I wouldn't be motivated to learn outside class. But since we had the choice that we could do it at our own pace, and that I could take as long as I wanted to learn it, then it'd would help me to say; ok, I have all the time I need, I don't have to ehm.. learn it, well we did have a due date, but that was for a couple of weeks, so that didn't affect my ehm.. learning, I mean it did affect my learning in a positive way.

Interviewer: "So you did need the deadlines, or the classes to.."

Interviewee 12: "Yeah, I did need the deadlines, for like our final goal.

Interviewer: "So you needed in-between deadlines to set by somebody to force you actually focus and work.

Interviewee 12: "Well, 'force'... just to like guide...

Interviewer: "lead you to, guide, sorry for that 'force' that was definitely the wrong term. You were given student voice. Were you an assessor?"

Interviewee 12: "No"

Interviewer: "No. Ok. But still, it was clear, every group had an assessor, and there were in the end 6 students or so assessing with me. What did you think about that?"

Interterviewee 12: "that was ..."

Interviewer: "What did that do to you?"

Interviewee 12: "Well, it didn't do much for me or to me; it didn't affect much my performance, but I mean I guess that grading could have been eh was more personal because it had the co-assessors, because one co-assessor was from our group. Each co-assessor knows at least one from each group, so it also showed like, for example Lotte was our co-assessor, so she actually knew how much work we put in, so it would be easier for her to day our [inaudible] performance against the work we actually did, compared to a teacher that might not have seen .. gone through the entire process with us."

Interviewer: "yeah, so you're saying it's fairer because of that?"

Interviewee 12: "sort of, yes"

Interviewer: "Did it make you feel more comfortable?"

Interviewee 12: "eh....."

Interviewer: "I mean like sort of less relient on the final 'vote' of the teacher?"

Interviewer: "Yeah! sort of because then Lotte could also see our progress throughout the weeks and not just our final result."

Interviewer: "Ok, allright. Then the last question, number 3, says try to weigh, you know, was that ..[reads out the 5 aspects]. Which would you say was most important to you and which was second important to you?"

Interviewee 12: "Oh, well the first was you were free decide within your group on the type of technology for the final task, because that really allowed us it did give us the choice, of course we were limited by the fact that we had to record digitally or audio, our task, but I mean that was required anyway, but the way we did it we weren't restricted."

Interviewer: "What did you do? What task did you do?"

Interviewee 12: "We shot a video, eh we shot a quiz that emphasised pronunciation."

Interviewer: "Which one would be second best?"

Interviewee 12: "Em... the group task itself. Because then we could show off kind of what we had learned. But for some students 'showing off' was less than for others, because we could all - we were all close to the level that we had achieved."

Interviewer: "That was clear, for the students it had to be linked to the pronunciation. Em.. so, free choice of technology and the group task is more important to you than the vote and than the iPads, so the personalised learning, and the group support."

Interviewee 12: "Yeah"

Interviewer: "Ok, allright, thank you very much."