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Memorisation, review and ensuring knowledge sticks
Editorial

In this issue we reflect back on two dimensions of research at IVC and our fruitful links into wider partnerships. Two recently completed MEd’s taken through our link with the SUPER (Schools University Partnership in Educational Research) demonstrate the impact that looking deeper into educational issues can have on personal practice. They also offer us all interesting reflections on the importance of enriching student experience through trips and extra-curricular activities. They remind us also of the importance of the broad and balanced curriculum we offer which must include opportunities for small ‘c’ creativity and activities beyond standard lessons if students are to develop as independent learners who engage and achieve.

The second dimension emerges from our link to CASSA (Cambridge and Suffolk Schools Alliance) where we are able to access interesting research being pursued in nearby Village Colleges, in this case, Sawston. The ideas being pursued about the importance of memorisation of knowledge and review are crucial to the future success of our students. Knowledge in education has become fashionable not just because it is a right wing bugbear linked to alleged decline in standards. There has been for many years a false dichotomy between knowledge, understanding and skills. Students deepen their understanding and develop their skill in the context of what they know. It is not just because the new specifications require increased recall of more detailed knowledge that we have to focus on getting students to remember things; it is that great learners accumulate great knowledge and expertise over time. How we let the students remember is, therefore, crucial.

Contributors

Kathryn Aybak teaches art at Impington Village College and recently completed a well-received Master’s in Education through the University of Cambridge. I would urge you to read the full detail as she presents provocative findings and uses interesting research methods.

Andy Baldwin is Lead Teacher of PE at Impington. He also recently completed his Master’s in Education at the University of Cambridge.

Mo Middleton is Lead Practitioner for Humanities at Impington with a strong background in research. Mo is connecting our research activities with the work of our Professional Learning Group.

Mike Murray is Assistant Principal for Staff Development, Humanities and our Teacher Research Lead. He edits and founded the impact journal and represents College research at SUPER and CASSA.

Note rather than overwhelm with academic references we have gone for recommending the key links or texts that influenced the discussion in these pieces and which we think a busy teacher might find time to read.

However, for those interested in going deeper any of the contributors is happy to be contacted about a fuller set of references.
Can art trips and artist practitioner visits help students’ understanding of creative knowledge and/or skills? A study of Year 9 and 10 Art-Textiles students in a village college.

Kathryn Aybak

Impington’s founder, Henry Morris, was passionate about putting art, architecture and colour into school. He had a vision for a democratic access to art for all pupils, abolition of the ‘insulated school’ and for lifelong education. In the present educational climate I became concerned that narrowly defined goals were driving both teachers and students in a target-oriented model of education, and that ‘the performativity discourse is hijacking the creativity discourse’ (Turner-Bisset, 2007, p.201). I am motivated by issues of equality of opportunity, employability skills and the value of creativity and Art within education. I began to question how does Morris’s creative vision fit, in today’s marketised target driven educational culture? (Sahlberg, 2013).

Creativity with a small c

Whilst the importance of creativity in education has been emphasised in the last decade (Jeffrey and Craft, 2006), the current Department of Education’s (DfE) lack of emphasis on creativity and the arts, together with Nicky Morgan, the Education Secretary, announcing in November 2014 that only STEM subjects lead to careers and that the arts were not useful for future careers, stands in direct contrast with research on for example, ‘little c creativity’ (Craft, 2001). ‘Little c creativity’, could help with students becoming flexible and divergent thinkers, which the current economic climate requires, especially as many argue that the UK is out of step with the global market (Hannon, 2012 and PISA results, 2012). This reinforces the necessity for keeping creativity at the forefront of the educational debate. Whilst within education one of the key features of Art, suggested by Maslow (1968), Boden (1996) and Lucas (2002), is the sense of there being no ‘right’ answer or method, students could achieve a positive task outcome through creative processes of learning, as defined by their own expectations, and according to this theory improve engagement (Lee, Morrell, Marini and Smith, 2012). Linked to this is Csikszentmihalyi’s flow theory (1988; 1990; 1994; 1996), which combines the ideas of emotional and behavioural engagement with an activity.

Key research questions:

- How does Henry Morris’s creative vision fit, in today’s marketised target driven educational culture?
- Do trips, such as to the NEC Fashion Show, help inform students about creative careers/skills?
- What is the relationship between an art careers event and the perception of art as a career choice?
- Can doing sustained art activities, such as during an artist day workshop, encourage creativity and motivate students?
- Does the performativity driven nature of schooling get in the way of student’s creativity?
Research focus

Many students and parents have told me that they do not know enough about Art careers and are concerned that Art is not a secure option post-16; it can instead be viewed as a leisure activity. The perception that Art is not a serious option choice made me seek out data concerning employment in the creative industries. I discovered that these industries embrace a wide range of career routes and that, in the UK, total creative employment is 2,278,500 (7.8% of all employment)\(^1\). I questioned how I could help students make informed choices about creative careers.

With careers guidance having been taken away from local authorities and handed to schools (September 2012), schools could feel under pressure to provide the necessary skills, to fulfil the duty put upon them, on top of the need to deliver results. I became interested in investigating whether taking students out on Art trips and, more specifically, to creative careers events could help students to understand about creative careers.

Further to this I wanted to investigate creativity and flow (Csikszentmihalyi, 1990 ‘Flow theory’) during an artist workshop and compare this to a normal school day.

Trips and creative careers

The findings from two questionnaires, one completed before the trip and one after and five semi-structured interviews indicated that the trips had a positive impact on student’s understanding about creative careers. 100% of students said that the trips had informed them about creative careers and that they knew a lot more about types of careers in the arts after the trips.

Key themes emerged after the trips. Over half of the students identified: learning from others, real-life learning, learning as fun, trips as motivating, inspiring and helping with creative techniques. They also said they got access to appropriate and up to date information and resources, skills and ideas. These themes were supported by comments made during semi-structured interviews. These findings support some of the initial themes I had identified through the literature review on creativity, learning environments and creative partnerships, with a mixture of inductive/deductive approaches adopted.

<table>
<thead>
<tr>
<th>Themes</th>
<th>Supporting comments</th>
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<tbody>
<tr>
<td>Learning environment</td>
<td>You learn more on a trip cos you get to see stuff you don’t see at school. (Year 9)</td>
</tr>
<tr>
<td>Learning from others/social interaction</td>
<td>They’re kind of like the modern way of people at college as opposed to when teachers went to college. (Year 10)</td>
</tr>
<tr>
<td>Real world learning</td>
<td>It is important to see artists work in real life. (Year 10)</td>
</tr>
<tr>
<td>Learning on trips as fun and intrinsically motivating</td>
<td>I find it more fun and it’s really enjoyable. (Year 9)</td>
</tr>
<tr>
<td>Art as fun and intrinsically motivating</td>
<td>I enjoy this subject a lot more (Year 9)</td>
</tr>
<tr>
<td>Art careers/risky</td>
<td>I guess cos it’s unknown. (Year 10)</td>
</tr>
<tr>
<td>Extrinsic motivation: Careers</td>
<td>You could see like a bit more, a range of things that you could do in your future like um to carry on with Art. (Year 10)</td>
</tr>
</tbody>
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Art related careers

The perception of Art and art careers was largely a positive one. After the trips this positive perception increased as they felt better informed about careers and courses in the creative industries. I had not expected so many students to view Art careers in a positive light. The majority thought Art was enjoyable and intrinsically motivating, but they also thought it was diverse and therefore careers could be difficult to understand.

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Impact of a day with an artist

To investigate this area I used Experience Sampling Forms (ESF’s) (Bryne, MacDonald and Carlton, 2003) for the artist workshop day and compared these to a normal school day. These should determine whether or not ‘flow’ occurs, if three of the conditions of flow were present. I also used visual methods, with questions inspired by Getzels and Csikszentmihalyi (1976) to visually analyse the work produced by students on the all-day artist workshop day.

Analysis of ESF’s indicate positive correlations between levels of ‘flow’ indicated and assessment of creativity. Students’ did experience ‘flow’ during the artist day, as three or more of the conditions for flow to occur were present. It could therefore be concluded that aspects of flow, including the balance between challenge and skill and no worry of failure, were evident during the artist day. This supports Csikszentmihalyi’s theory of flow and corroborates evidence from studies citing the positive effects of students engaging with artists. Students feel more energetic, focused, cheerful, involved, excited and confident during the artist all day workshop, compared to the normal school day.

This graph illustrates the findings. A visual analysis of the art work produced by the students who had completed ESF’s suggested correlations between levels of creativity and levels of optimal experience. It could be surmised that a day of doing Art was enjoyable.

Performativity and its impact on creativity

It is possible to speculate that students do not experience flow/creativity during the normal school day because there are more time pressures on them. The fragmented nature of the day could make immersion in an activity difficult, whereas during the artist workshop students had more time to develop creative work.

I am able to conclude that working in a variety of contexts with different creative practitioners helped to enable creative thinking, and that overall these experiences promoted positive learning experiences. These results are context directed and do not represent all Year 9 and 10 students, but my aim was not causality but ‘understanding’ (Maxwell, 2002 in Huberman and Miles).

Conclusions and recommendations

It is clear from this data that not only do Art teachers need to provide opportunities such as trips, for students to understand about creative careers and skills, but more generally schools and politicians need to be receptive to the benefits to pupils’ learning, when taken out on trips. These also advocate the need for time to be given to creative activities, especially important given the current educational climate.
It has not been possible to accurately assess how trips and artist visits have helped with creativity, but that participants do seem more motivated by being given freedom, meeting with others, and learning from the real world.

Within an educational context I still posit that creativity is best described of in terms of problem-solving (Craft’s ‘little c’, 2001) and as a process of active, constructive understanding (Fleming, 2010). After reflecting upon Art’s role in creativity and student comments and how intrinsically motivated they felt by the Art making process, I arrived at the conclusion that Art can be about novelty and originality and does offer something new. This does not alienate some students and make the creative process only open to a few, but reinforces the need for all students to be given the opportunity to experience different learning experiences in a variety of contexts. The idea that all subjects can be equally creative could contribute to it being further marginalised. Findings from the artist workshop do show that students produced creative work and experienced ‘flow’, which I do not think is possible in all subjects.

This particular research focused on trips and an artist visit, but there was little opportunity to explore other ways of developing creative knowledge such as connections with local galleries and creative connections across subjects, including within traditional EBacc subjects.

Relevance of this research

The importance of creativity and its benefits for future generations is not a current focus for the DfE. This was one of the reasons I felt it necessary to investigate creativity in school. This focus on creativity may seem justifiable, as more and more of our time is spent reaching to performativity based targets, which Hodgson and Spours (2012) suggest occupies a teacher and student’s attention to such an extent that education becomes detached from the economy. This focus on achievement in the core subjects could lead to Art’s contribution being diminished.

Having initially been inspired by my students to carry out this research, my passion still lies with informing students about creative skills and creative careers. When I was lead teaching the Art BTEC I felt that some of the more applied aspects of Art learning were better addressed by that course.

This research has enabled me to become a more reflective practitioner (Schön, 1983) and to continue with this research process. I have begun to investigate the ways in which other schools embed creative knowledge and skills, and inform about careers. I recently contacted a post-16 college, which is more vocational in focus, and interviewed the Head of Art. She explained how the college invites outside clients to meet the students and set live briefs; not dissimilar to the work by the Sorrell Foundation (YDP, 2005). The concern however is that in the current educational environment, opportunities for developing creative thinkers for the future economy could be inhibited. Students could worry about getting things wrong and taking risks (Holt, 1984). Further to this, if, by 2017, about half the new jobs in the UK will be coming out of the creative sector, it is imperative students have more knowledge about these jobs. However, we need to be mindful that we are not preoccupied, as Oakley (1994, p.23) states, with young people as ‘becoming’ and with their status as ‘would be adults’, rather than the here and now state of ‘being’, which could also contradict the process driven creative process.

I would like to further investigate the inherent contradictions within an educational system that is, on the one hand, preparing students for a competitive, fast moving, globalised marketplace, and demanding skills of flexibility and innovative and creative thinking, whilst on the other is squeezing out arts and creative subjects in favour of STEM subjects and a target-oriented model of education.
Key recommended reading


Fuller references referred to in text available on request from kaybak@impington.cambs.sch.uk
Extra-Curricular Activities and Attainment in Maths: the Good Bits

Andy Baldwin

We all want to know that what we are doing has value; that somehow we are positively affecting outcomes and not going through the motions because of a nostalgic view of what we should do. There seemed, on the face of it, no need to conduct research to know that good things are happening due to the extra-curricular activity. Isn’t that obvious? But studying for a SUPER Masters gave me the tools to be able to measure, analyse and be better informed as to what exactly these ‘things’ are. So I bought a new pad, pen and folder and went back to school!

**Key research questions:**
- Do the different types (physical, skill, volunteering/community) of extra-curricular activities (ECA’s) improve maths attainment?
- Does the amount of time spent in an ECA improve maths attainment?
- Does the length of time spent in an ECA improve maths attainment?

**Results**

Not surprisingly we can say yes to the all the above. Involvement in ECAs correlates positively with improvement in maths attainment. The more time (account and length) spent on ECAs correlates positively to more positive impact on maths attainment. What are more useful are the size of the impact and the potential direction of the relationship.

“Involvement in ECAs correlates positively with improvement in maths attainment ……. What are more useful are the size of the impact and the potential direction of the relationship”

**Key findings:**
- Skill development based extra-curricular activities had the largest impact, then volunteering/community with physical ECAs having the smallest impact (but still positive).
- This was again in reference to the type of ECA and based upon each activity lasting at least an hour each week. Once again the smallest impact was seen in physical ECA’s (still positive though) and the largest in skill type ECAs.
- As before in reference to each ECA type. All three ECAs demonstrated a positive impact on maths attainment in relation to the length of time spent participating. Once more skill based ECAs had the largest impact and physical the smallest.

**Recommendations**

The important part is what we now do with these numbers, statistics etc….

A little bit aside from the big scary regression models and use of moderator variables and ‘stuff’ I used a natural experiment design (grouped people by what they were already doing). Fortunately I had a group that did no ECAs at all to compare with. Just a quick look at the group
averages showed that students that did not participate in any ECA had far lower attainment than those that did all 3.

But (lots of caveats in research), the highest percentage of pupil premium students existed within the non ECA group. So, with the knowledge of impact of ECA type, time and duration what can be done in particular to support pupil premium students? On a simple level it would seem that we need to facilitate a skill based ECA for at least an hour a week and for as many years as we can (target year 7) especially for our more disadvantaged students. This fits well with the planned rolling out of iCAS and monitoring by tutors of ECA.

However (another caveat), the numbers don’t tell the whole picture, it may well possibly be the dynamics of the group they are in (social capital/leading crowd) or even the personal motivation of the student themselves that the impact can be attributed to.

Benefits of completing the SUPER MEd

Quite simply, this was the best piece of professional development I have ever done. The world of research is a big scary place full of really clever people using very complicated terminology and then comes the part when you need to let people critique what you’ve done...

Being introduced to it all and then having your hand held through it is quite empowering. Taking a look at what is happening around you, not just pedagogy, trying to understand relationships and their impact can actually become interesting. That little bit of confidence inside that says you know (or at least you know where the book about it is) a methodology and method for figuring that problem out is vital. It’s a reminder, you’re a professional and not just a cog grinding every day.

Recommended further reading


Fuller MEd references available for abaldwin@impington.cambs.sch.uk
Memorisation, review and making knowledge stick: report back on CASSA Research and Development conference

Mo Middleton and Mike Murray

At Sawston Village College, within CASSA, our teaching school’s alliance, a number of staff had done pieces of master’s research on recall and knowledge. They also accessed Sue Gathercole from the Brain Science Unit who works with people who have problems with short term and episodic memory. We have tried to sum up some of the implications of their research for our practice here at IVC.

Why is memorisation of knowledge so important?

- Exams are becoming more memory and long term based
- Knowledge is vital to activate skills or understanding
- Memory problems mean learning does not last

There are 3 types of memory

Students work with unfamiliar ideas in their working memory. If you have ever tried to take in a set of directions in an unfamiliar place you know how easily this can be overwhelming. If we give out too many instructions at once to students it can feel like this.

Teaching needs to move ideas out of this into memories of a recent episode i.e. the lesson and by practice/association into the semantic or procedural memory. We can, for example, all eventually drive, yet the number of instructions and factors to remember at first seems impossible: it becomes almost automatic, therefore, drawing on procedural memory by experience.

We all know Paris is the capital of France without thinking as we have come across so many examples related to it in terms of news, images, stories and analogies.

Visual note-taking helps many people to memorise knowledge more readily

This YouTube clip shows you what we mean by visual notes but any diagram, mind-map or graphic organiser helps to some extent. [https://www.youtube.com/watch?v=InUvZEeNiII](https://www.youtube.com/watch?v=InUvZEeNiII)

Pie Corbett’s work on literacy shows that talking, acting and making pictures together creates strong story associations which allow children’s writing to develop.

Key findings:

- To hold knowledge easily you need to get students to transfer it from short term to episodic and eventually to semantic/procedural memory
- Visual note-taking, revising through signs, analogies and metaphors helps associate ideas more permanently in the brain
- Practice and frequency is crucial
- Review/revision should be interleaved within the learning and not done only at the end if it is to stick
- Don’t give too many instructions at once so as not to overload working memory
- Pre testing helps make remembering later easier
Visual imagery

Activities using signs, pictures and association help students to place their episodic memory i.e. of a recent lesson into a longer term bit of semantic/procedural memory with knowledge so secure it can be quickly and easily retrieved. They create metaphors by which students can describe their knowledge: turning points, going around in a cycle, zig-zagging. For example, road signs can be used to associate the different directions of events, characters, processes or tactics. They also flag what you associated around the diagram.

Practice, frequency and interleaving

The research supported other findings from educational research. Testing understanding throughout was much more effective than all at the end. Revising in manageable chunks and reviewing within lessons all helped knowledge stick. Relying on students to do the memorisation outside of lessons without checking it was only likely to distinguish the motivated learners not lead to all progressing.

Pre-testing

One interesting finding was that pre-testing before students even did a topic not only identified what they already knew/ felt they had associations with as a baseline but actually helped

a) Memorisation: they remembered their mistakes and sought to correct them
b) What to remember as the teacher had pre-selected the most useful and important bits to remember avoiding irrelevance.

This fits well with our Impington Experience “Planning backwards to teach forwards” but ought to be built into activities. Pre-tests were also seen far more as low stakes and so the students concentrated more on correction and feedback rather than their score so could have a greater formative impact.
Recommended further reading:


Christodoulou, D (2014). *Seven myths about education.* Is a controversial popular text from a teaching school chain emphasising a revival of knowledge.

Presentations from the conference [https://professionallearningsawstonvc.wordpress.com/2015/10/20/unforgettable-teaching-how-can-we-teach-in-ways-that-help-pupils-to-remember](https://professionallearningsawstonvc.wordpress.com/2015/10/20/unforgettable-teaching-how-can-we-teach-in-ways-that-help-pupils-to-remember)

Willingham, D.T (2010). *Why don’t students like school?*

Carey, B. (2015). *How we learn*
Recommended reads

Daniel T Willingham, Why Don’t Students Like School? (2010)

Rating ★★★★★

Cognitive scientist, Willingham, reveals the importance of story, emotion, memory, context, and routines that build knowledge in creating lasting learning experiences. He offers 9 principles to support classroom practice and insists that skills cannot be taught effectively without embedding knowledge.

Benedict Carey, How we learn (2014)

Rating ★★★★★

Science journalist Carey tackles lots of myths about learning including that it needs to be boring, undistracted and individual. He finds:

Self-motivation to learn is essential. Self-learners learn better. You will naturally learn better when you’re truly interested in the subject. The achievement of learning something new is reward in itself. Collaborative learning is easier and more fun. Tell others what you’re learning – it will enhance your learning and understanding.

While seems obvious, the implications for engaging learners are less so.

Matthew Syed, Bounce (2011)

Rating ★★★★★

Syed argues that almost all successful people got to the top through effort and practice as much as talent. Like the 10,000 hours study, practice is what makes perfect.

However, he also has some interesting insights into how important getting the context and set up of what is practiced and refined correct as we are not always able to apply easily lessons learnt in one area to another.

Recommended links

Blog with all the memory conference presentations
https://professionallearningsawstonvc.wordpress.com/2015/10/20/unforgettable-teaching-how-can-we-teach-in-ways-that-help-pupils-to-remember

Interesting article on the science of learning www.deansforimpact.org/pdfs/The_Science_of_Learning.pdf
www.talk4writing.co.uk provides useful literacy ideas from Primary Guru Pie Corbett and Sue Young

Refer to X drive: Top Teaching Tips: Autumn 2015 for the range of practical ideas offered every Friday.