

“Tell me and I forget, teach me and I may remember, involve me and I learn”.

- Benjamin Franklin

Teacher effects



Research shows that compared to other learning effects, teacher effectiveness is one of the factors with the **largest effect** on learning. Willam (2007) notes that initially research into learning effectiveness used **raw data** finding that some schools performed better than other schools. This led to education research believing that it's the school that makes the difference, and furthermore, that schools in better areas would outperform schools in less privileged locations. This led to the belief that controlling **social class** and **poverty** would influence learning effectiveness. However, when a **value-added model** is used in which research measured what students knew at the start of the year compared to what they knew at the end of the year this showed that learning was significantly impacted by the teacher regardless of school or social class. In fact, it was found that there is a four fold difference in learning based on teacher effectiveness. If a student receives one of the best teachers they will learn in 6 months what it takes a student receiving one of the worst teachers in two years. Teacher effectiveness has more impact than class size, between and within class grouping. Furthermore, Willam (2007) states that **new teachers are the least effective teachers**, but as teaching experience increases so does their effectiveness. This additive effect of teaching carries on increasing for about 20 years.

Willam (2007) further suggests that **quality control is key** in learning and teacher effectiveness. Just as one cannot predict perfect learning, one cannot predict perfect teaching. However, **student errors are not random**, as was previously thought. Willam (2007) cites this as one of the most valuable things psychology has illuminated in education and learning within the 20th century. Most teachers when faced with a student who makes mistakes repeats what said student needs to learn more loudly and

more slowly. This, at face value, can be somewhat effective, particularly for rote learning, for example with topics like multiplication tables. However, when it comes to the type of learning that requires deeper understanding of concepts and principles this method is essentially useless.

Additionally, much research in education and learning has focused on learning styles, which Willam (2007) calls 'fruitless'. Whilst it is important for the individual student to know and harness the learning style which works best for them, it is not possible or effective for teachers to cater their teaching to every individual and their corresponding learning style. Not only is it impossible, it is also pointless. Students being taught in a learning style which suits them is comfortable and easy. This is one side of the coin of learning. However, learning in styles that bring students out of their comfort zone is equally if not more valuable to them. Therefore, it is important that teachers give their students a balance of different approaches. Knowing which student learns in which way is not particularly important as long as the teacher varies their teaching styles in a balanced but dynamic and engaging fashion.

The most effective teachers are those who realise that creating '**learning power environments**' is key. Teachers do not create the learning but they do create the environment in which learning takes place and if they are effective this creates a very powerful tool in promoting learning. Willam (2007) considers the key factors in creating effective learning environments:

Teachers do not create learning. Learners create learning.

- Dylan Williams

- **Pedagogies of Engagement.**



Some students in the classroom actively and naturally engage with learning. Said pupils are consistently **putting their hands up** to ask and answer questions. Neil Mercer found that students who

engaged in meaningful dialogue in science lessons showed improvements on Raven's progressive matrices, meaning **actively engaging in the classroom environment increases cognitive ability**. The role of the teacher comes in here because in order to be an effective teacher who promotes learning, one must **engineer an environment which encourages students to engage**. Some pupils actively avoid engagement and even fear it, avoiding asking and answering questions. The teacher who sits by and allows this is the ineffective teacher, who will not produce good learning effects. Teachers must create dynamic learning environments, inclusive of all students in which **participation is compulsory, not optional**.

How do we enable students to engage? **Flow**. Hungarian psychologist Csikszentmihalyi suggests that in order to get students to engage effectively, teachers should challenge them at just the right level. Too much challenge and students become stressed, too little and they become bored, both leading to disengagement. When given an appropriate challenge students are motivated to engage, the idea being they **lose themselves in learning**, creating flow.

- **Pedagogies of Contingency.**

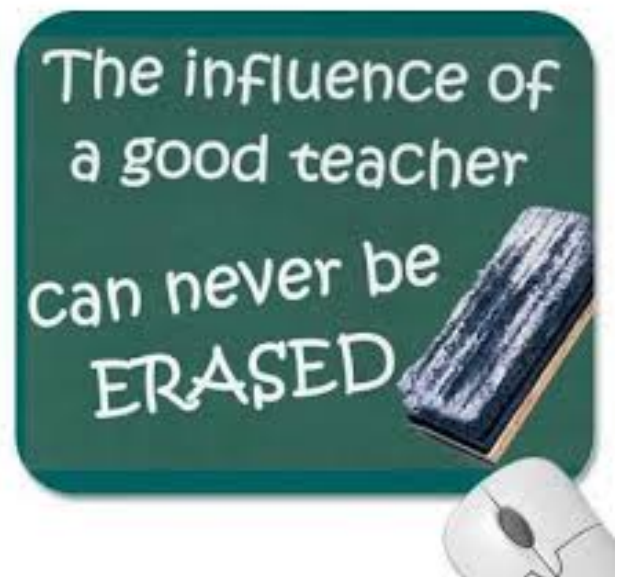
So it's been established that engagement is key. However, **feedback is also essential**. Due to the fact that learning is unpredictable, constant assessment and feedback is needed to control the quality of the learning taking place.

Jeffrey Nyquist (Williams, 2007) conducted a meta-analysis of over 180 studies on learning. These studies looked at different kinds of feedback and which were the most effective in increasing learning. Weak feedback gave an increase in learning with standard deviation 0.14. However, the more feedback was strengthened by being formative, the bigger effect size observed. Research in education has formally advocated techniques such as **reducing class size** to increase learning effects, however, this is very **costly** and practically very hard to implement. **Increasing teacher content knowledge** in order to improve their effectiveness and therefore learning has been suggested too. However, it was found that increasing teacher content knowledge by one standard only increased student learning by 5%. If we compare these methods

to the effect size seen by improving formative assessment and vast improvements can be seen. **Teachers effectively engaging in formative assessment creates a 75% increase in learning speed** and costs only 2000 pounds per classroom (compared with 20,000 to reduce class size). Furthermore, the economic benefits of improving ineffective teachers is huge (Hanushek, 2011).

Concluding thoughts on teacher effectiveness:

Whilst teacher effectiveness has been identified as an important factor in learning effects, this is less to do with the person behind the teacher being able to induce learning in the student. It has been falsely implied throughout education that the teacher creates the learning. This is not true - the learner creates the learning, the teacher creates an environment and encourages behaviours which enable students to learn effectively. Student factors and SES also influence learning which is beyond the control of the teacher, therefore - although they may be 'effective' - learning is contingent on many factors, not just one. Although teacher effectiveness is certainly one of the main and most important impacts on learning.



Extra Resources

https://www.ted.com/playlists/125/tv_special_ted_talks_educatio

This link to Ken Robinson: How to escape education's death valley touches upon some of the points mentioned by William's. Particularly about the importance of engagement and teachers being facilitators of learning through creating effective learning

environments and discussion. He also offers some additional thoughts on education and the values in place today within it.

If you were to choose one paper to read on teacher effectiveness and learning effects in general, I would definitely recommend reviewing the transcript of David Williams's key note speech. Available online at: <https://www.alt.ac.uk/altc2007/>

Now to look at some other factors which whilst to a lesser degree, still impact learning.

Technology

Clark (1983) famously claimed that the media and technology had little to no effect on learning.

[Technology is] *“Mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition”*. - Clark (1983).

Clark notes there exist two types of technology:

- **Instructional** - Software designed to create and stimulate learning environments that are specific to the subject. E.g. online testing or task orientated tutorials.
- **Delivery** - For example, computers, ipads, smartphones and the internet itself. These are the media channels through which information can be gained and instruction, training and testing can be administered. These are influenced by cost and access.

Whilst this remains broadly true it is important to note that this research is now over 30 years old, in which time technology has made tremendous and fast paced gains.

However, the main principle from Clark's work is whilst technology can facilitate learning it does not create learning. Relate this back to what Williams said about teacher effectiveness, "teachers do not create learning, learners create learning". This is much the same in relation to technology. William's (2007) suggests that technology can be extremely useful in improving teacher effectiveness, if they use said mediums to **help inform their formative feedback**, which as we know hugely increases learning speed. So in this way technology can help facilitate learning. The crucial point to remember is learning does not occur because technology is being used, but it can certainly be enhanced by using it.

More recent meta-analytic studies support this idea. Higgins et al. (2012) found that overall research from the last 40 years shows **consistent small positive effects of technology** on learning. However, the increase in variation of type of technology and financial factors make it hard to establish a cause and



effect. The **key point** of this research is while technology has a positive impact on educational outcomes, it is not possible to tell if it is the technology making the difference or that more effective schools and teachers utilise these resources more effectively than other schools. Although based on the research consistently highlighting the same point, i.e. **technology is a resource to improve and enhance learning but not the root of learning**, we can summarise that it is the way in which technology is used effectively, not the technology itself which gains learning effects.

- **Pedagogy of the Application.**

It is the way in technology is used to **engage** and **motivate** learners which makes it effective. Only being of an benefit if the technology is appropriately used to support the content of learning and the learner. It is how it is used, rather than what is used.

Furthermore, in relation to other effects on learning, the effect size of technology is much smaller, for example in comparison with peer effect or teacher effectiveness.

Higgin's et al (2012) attempted to identify some **trends** from the meta-analytic research.

- **Collaborative** (in pairs/small groups) use of technology is more effective than individual use.
- **Frequent but short use** of technology enhances learning rather than repeated long-term use of technology which may hinder learning.
- For those students who are more disadvantaged than others and may require **remedial learning**, use of technology is especially effective in helping them catch up with their peers.
- Technology is most effective when used to **supplement**, but not to replace normal teaching. (Think about this in relation to how much of a push there is within schools to utilise technology as much as possible).
- **Science and mathematics** see more learning gains through the use of technology than other subject such as literacy.
- Teachers need **training focused on how to use and apply technology effectively** in a learning environment. Not just training on how to use the technology generally.

Concluding thoughts on technology.

Technology is fast paced and constantly changing, hence, it is important that research is up to date. However, it appears to be one common trend throughout the research, recent or older and that is technology can facilitate learning, but it does not cause learning. Relating this back to William's thoughts on technology, educational systems should be promoting the use of technology to enhance the applications which we already know improve learning. For example, in formative assessment. Linking this to teacher effectiveness, better teachers will use technology to create an environment conducive to learning.

Classroom based effects

Classroom based effects on learning are **non-verbal cues** and influences immediately seen by students entering the learning environment, whether that be a classroom, lecture theatre or seminar room. The learning environment can portray different things to the learner. If the classroom is visually appealing with lots of examples of students' work it shows the learner that this is an environment where not only is learning expected to take place but also pride is taken in this and learning is valuable (Houston & Grubaugh, 2015).

Take these two examples:

- A classroom set up with rows of separate desks and seats, blank walls and the visual direction of the learning being focused towards a blackboard or screen. This gives a signal to the learner that this is an environment to sit quietly, do not interact with others and listen and learn from the teacher at the focal point of the room. This sort of environment reduces interaction and isolates the learner.



- Compare this to a more dynamic environment. Entering the room the student



sees groups of desks, multiple learning resources such as computers, interactive whiteboards, posters and colour. This tells the learner that there is a multitude of ways for them to harness resources and engage in learning. More importantly, it encourages interaction and creativity, which in the end leads to a richer and more diverse

understanding of the concepts and details of what they are trying to learn.

Furthermore, different learning environments give the student an idea of what is socially expected from them in this environment, i.e. to be quiet, listen and learn individually or that interaction and communication is encouraged. The type of learning environment and how effective this is will vary on the subject taught, a science class will be set up much different to an English class, but all classroom environments can benefit from utilising the space in a way suited to said subject.

One of the most important aspects of classroom effects on learning within the research is **seating arrangement**. Again this is a non-verbal organisational cue which can affect student interaction and therefore group and individual learning (Houston & Grubaugh, 2015). Seating students in desks arranged in clusters or groups promotes:

- more hand-raising
- peer-interaction
- participation in discussion
- oral communication.

Whereas students seated in rows of desks tend to engage in more off-task behaviour (Black et al., 1985). Arranging students in a semi-circle or horse-shoe around the teacher encourages group discussion and interaction (Houston & Grubaugh, 2015). This organisation of seating arrangement can promote participation and discussion

because **all the learners become a member of the same group** and they become more prone to **actively engaging in listening** and make more **eye contact with their peers**, all signs that learning is occurring (Houston & Grubaugh, 2015).

These effects on learning will depend on **context**. In a seminar or tutorial where discussion and oral engagement is important these applications will be useful, whereas in a lecture theatre they may not be as useful. However, looking at the **lecture theatre environment** seating also has an impact on learning.



- Benedict and Hoag (2004) found that students who preferred to sit at the front of lectures tended to receive better grades than those who preferred to sit at the back of lectures. Independent of preference, when students were forced to sit at the front during lectures they received higher grades than those who did not. Therefore, seating preference and actual seat location may be two independent variables affecting learning, one based on the individual learner and the other classroom based effects. Seating arrangement is not the only impact from classroom based effects, however, much of the research in this area focuses on non-adult education and is more limited in the research regarding higher education.

Concluding thoughts on Classroom based effects.

Schools and higher education institutes commonly push for students to help create what looks like dynamic learning environments for school open days, many more pictures on the wall, lots of colour, making use of interactive whiteboards, and arranging classrooms differently. However, these are not commonly put into practice on a day to day basis for learning, which is problematic. Schools know what they should do to create enhanced learning environments but practically these aren't always possible, based on how

enthusiastic the teacher is about implementing such structures and time and financial resources, as well as coping with how individual students respond to said learning environments differently. Furthermore, teacher effectiveness may interact with how well they understand classroom effects and are able to utilise and control them. And, as mentioned, different environments warrant different classroom adjustments to enhance learning and one of the most prominent ways a classroom can be adapted is by seating arrangement.

Classroom Application

Now we will discuss how applying the above theories to your classroom (at any educational level) will improve the learning of your students. We will discuss in detail particular strategies and theories that can come right off this page and into your classroom today. We will give detailed analyses of the effectiveness of these strategies particularly focussing on the Jigsaw Classroom and the Interactive Workbench approaches.

Jigsaw Classroom

The jigsaw technique organises the classroom so that peers are dependent upon each other in order to succeed in their lesson. It is a cooperative learning technique designed to reduce conflict (particularly racial conflict) between students and downplay negative competitive behaviour. It has a four-decade track record for benefitting the classroom in four key ways

- Reducing racial conflict
- Improving test performance
- Reducing absenteeism
- Increasing students liking for school

The [Jigsaw classroom](#) was designed to diffuse long-standing tension brought on by beliefs out of students control in Austin, Texas following the desegregation of the public schooling system. This historical event found white, African-American and Hispanic students sat opposite each other in their classrooms for the first time ever. Feuds, riots and general miscreant behaviour were interfering with the learning of students and so the school district employed psychologist [Elliot Aronson](#) to advise on how best to amend the tension and improve the effectiveness of the students' learning, thus the Jigsaw Classroom was created.

Aronson designed his model for free access to all who wished to use it and provides an extremely easy to follow ten-step guide to the perfect lesson. Each student's part is essential therefore each student is essential, thus down-playing any feelings of superiority (or inferiority) within each jigsaw group. The steps are as follows

1. Divide into 5- or 6-person groups
2. Appoint one group leader
3. Divide the lesson into 5-6 segments
4. Assign each student to learn on segment
5. Provide time for them to familiarise themselves with their segment
6. Form "expert groups, by collaborating students from each group with their corresponding segment
7. Bring student back to their group
8. Each student present their work to their group
9. Float from group to group observing the process
10. Give a quiz on the material

For the most success using the jigsaw classroom technique it is important that groups are well diverse, including students of all ethnicity, race, gender and ability. Give the most mature student the role of 'group leader' and hope their maturity rubs off on

their group. Make sure the work load for each group member is of equal importance to the topic and make sure topics do not overlap so every student's research and teaching is not overshadowed by anyone else's. Allow students with the same topic an opportunity to discuss and rehearse for maximum confidence and relevance, also encourage question asking to enhance the interest within the group and again boost the confidence of the presentation giver. Finally, intervene when necessary; however allow the group leader to attempt to solve any issues first. For any further explanation please watch this [video](#).

Research has supported the initial motivation for the jigsaw classroom; it explains that students in a "jigsaw classroom" do show a decrease in prejudice, higher levels of self-esteem, lower levels of absenteeism, higher grades amongst other successful factors. Other interesting findings show how this technique also enhances students' empathy (Aronson, E., Bridgeman, D., 1979). Following the Jigsaw's success other psychologists also developed techniques to increase learning within the classroom. For a very simple review of other techniques see [the basic Collaborative Learning Techniques](#), Iowa State University. In a report Slavin, Hurley and Chamberlain (2003) express the importance of systematic cooperative learning techniques and how they have been applied in over 1500 (at the time) schools across America.

Technology and Interactive Learning

This section will discuss how technology has been added into the modern day classroom and the positive (and possibly negative) effect this has had on student learning. We will discuss two main reviews of this including 'technology as a learning workbench' and 'the digital learning classroom'. Both of which explain how different technology and different uses of technology within the classroom can enhance student learning and how to most successfully use them in your own classroom.

The link to each paper can be found at the end of the webpage.

[Technology as a learning workbench](#)

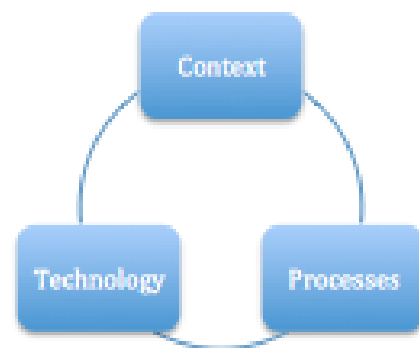
Writers Moonen and Collis have many times collaborated over their careers to discuss the effectiveness of technology in their own studies and classrooms, they share the view that *technology is a set of tools which offers affordances to empower people to share, build, support and manage their learning together* (page 6). They express the importance of an interaction between three components for successful learning: context, processes and technology. Below are some key factors to think about when designing a successful learning task

Context:

Include a mix of personal, social, organizational and cultural contexts.

Processes:

The most successful learning related processes involve users creating their own product.



Technology:

Using technology as a workbench supplies the user with tools to address their own problems and interests.

This review basically expresses the importance of integration of many factors and not just technology for the successful learning of student. It demonstrates how technology should be used as another operating tool for teachers just like books, lectures and seminars are and should not be a sole means of learning and teaching. It expressed how when using technology to aid learning there are extensive resources available on the web to create an ideal learning situation applying theories and

knowledge from the personal research of the writers. The main points to bring to your classroom from this extensive review are

- Use technology as a tool for teaching and not as the teacher
- Use varying technological resources to allow students to create their own assignments and learning resources
- Provide opportunities for collaborative learning as well as individual learning for your students to benefit most.

[Digital Learning in the Classroom](#)

This review demonstrates how 'digital learning in the classroom' with the use of Interactive Whiteboards reduces the achievement gap between students who are native and English Language Learners. This study found how initially teachers used their Interactive Whiteboards as a fancier chalkboard and no change to their lesson or teaching style was demonstrated. However, after a 'getting-to-know-you' period the teachers were much more comfortable and began to use their Interactive Whiteboards to effectively deliver a multi-sensory, highly interactive curriculum to their students. The teachers had also transformed their teaching methods into instructional practices that exploited the technological benefits of the Digital Learning Classroom, thus students began to respond differently and ultimately improved their attention and standardized test scores.

This review also explains how the digital learning classroom began to promote a learner-centred classroom, this encouraged peer interaction, teacher and pupil simultaneous learning and an opportunity to harvest common themes and interests in the classroom. This gave the students an opportunity to take control of their learning, a factor that has been widely stressed in techniques for successful learning. To summarise this review, it is important for technology to be correctly used in the classroom to create multi-modal elements to students learning, allowing them to

become completely involved in their own learning and education. Similar themes and findings are discussed in both of the previous classroom applications (jigsaw classroom and the technological work-bench).

Peer effectiveness

In addition to classroom based influences on children's learning, there are other factors which affect how well a particular child may learn. The peer interaction which takes place in and out of the classroom can have a massive effect on a child's education. At a vulnerable time of their life, children often want to fit in with their classmates and may place an equal



amount of importance on their schoolwork and contribute the same amount of effort as their peers.

A teacher will be likely to consider a child a good peer if they are successful learners and create a positive learning overflow which motivates their classmates to perform well.

Many studies investigating peer effects have come across difficulties in truly assessing it due to other external factors in a child's life. Children from a home which provides a good environment are more likely to be sent to the same school as other children from similar backgrounds (Durlauf, 1996). Furthermore, upon entry to the school, the children's parents will ensure they are being taught by the best teacher. The same may also happen due to school's grouping children together by ability level, to make teaching easier. This may lead to particularly well-performing children being in a class together

and significantly less successful learners being in another class. In this situation peer effects could not be blamed for the difference in educational performance of the children.

One study compared children from a school with randomly assigned classes to ensure this was not the case. The children starting school for the first time will be a reflection of how many births several years before were boys or girls. Due to this random variation there may be a higher percentage of girls than boys one year and vice versa. Any child joining in a specific year will be surrounded by this same peer group throughout school. Girls have been shown to achieve better grades and cause less disruption in the classroom in early years at school (Hoxby, 2000) Therefore a child surrounded by a higher percentage of girls during their education experience, will be positively influenced due to peer effects as all other factors are thought to be averaged out over the course of their time at school (Argys, Rees & Brewer, 1996). The same study also considered the race and initial performance level of students in their data. The study was conducted on pupils in elementary schools in Texas between 1990 and 1999 (the Texas Schools Microdata Sample). Educational success was based on a child's performance on the Texas Assessment of Academic Skills, this test is carried out in all Texas state schools.

The findings of the study by Hoxby showed that there was evidence of peer effects. As predicted, having a higher percentage of girls as a child's peers increases their success rate at both math and reading, regardless of whether the child is male or female (Hoxby, 2000). Girls are found to be better readers on average so this finding will be due to a direct positive learning spillover. However girls are no better than boys at math on average so this finding must be due to the lower level of disruption in the classes of predominantly females. The investigation into race and initial achievement level found that Hispanic and black pupils perform more poorly in the initial test. The study found that children being exposed to peers who have a lower ability level than themselves are negatively impacted by their fellow students and their grades tend to fall. In terms of

race, groups such as black and Hispanic are most influenced by the performance of their peers in the same race category as them. The results concluded that an increase of between 0.10 and 0.55 points could be seen in the test score of students in a class surrounded by peers who performed 1 point superior to themselves (Hoxby, 2000).

Personal Application

Now for the section arguably most useful to us students: we will discuss how applying the above theories to your personal study time will improve your own learning. We will give detailed analyses of the effectiveness of our proposed strategies particularly focussing on peer interaction, intrinsic motivation and finishing off with some very helpful web resources.

Peer learning

As discussed above, your peers are an extremely useful tool to increase effective learning. Although the application may seem obvious, we will now briefly review two techniques and ways to better involve peer interaction in your own study including Chi (2008) and Reciprocal Peer Critiquing.

Chi (2008)

In Chi's 2008 paper she emphasised the importance of constructivism within learning or how students benefit from producing their own explanations and adaptations from watching others. She demonstrates how watching peers receive one-to-one tutoring on video is as effective to students as if they were receiving the tutoring themselves. She claims that this was due to the viewing students having an opportunity to self-explain the work they were learning rather than just being told what to do. She also demonstrated how the learners were not viewing the teaching but also seeing how to learn in such an environment.

She articulates how this technique is most effective when watching in a small group of peers that offers an opportunity for discussion as well as self-explanation. Follow ups of Chi's study also express how a social element within learning promotes deep learning thus leads to higher attainment and retention of concepts learned. This is done by building upon existing knowledge and building upon this by experience the knowledge of others be that similar or opposing your own knowledge and beliefs. It is this way that student will most effectively learn from interacting with each other. For example, when watching a one-to-one tutoring video with two other peers there are potentially five different opinions, learning techniques and existing biases to contribute to your personal learning. Thus, creating an opportunity to gain 15 bits of knowledge as opposed to just your own three.

Reciprocal Peer Critiquing

On a similar notion, Draper emphasised the usefulness of peers critiquing and sharing feedback for maximum success, particularly in coursework based assignments. He proposes that in a peer group each bring along one piece of work to exchange, students must have in mind the questions they particularly want feedback on. Each student critiques the others' work and then offers face-to-face feedback around a table. Although this process sounds like an intimidating and uncomfortable experience students do not only benefit from the critique of their work but they also get to experience other students writing styles and understand how a marker may look at work, all of which will be a useful addition to their own piece of work.

In general, this is an extremely simple concept however Draper suggests having a tutor scaffold the first session in order to ensure all critiques are constructive and positive. He also encourages face-to-face discussion of the feedback so that all participating students fully understand the changes they should make can then therefore directly act upon it. This way students will benefit the most from the technique however not just for that one piece of work but all future assignments.

Motivation

Motivation has always been a high factor when discussing any successful learning. However, psychologists have expressed the difference between extrinsic and intrinsic motivation and how this affects learning. Extrinsically motivated behaviour is behaviour that is undertaken to achieve some goal, in our case a good grade, whereas, intrinsically motivated behaviour is just done for its own sake. The most simple example I can explain that relates to me would be in studying Autism Spectrum Disorder (a level 4 module this year), extrinsically I am studying the various theories that relate to Autism however intrinsically I already knew most of them, although admittedly not the official names or creators, from spending my summer working with children with Autism. Anyway, the theory goes that in order for deep and effective learning to take place intrinsic motivation is much more effective than extrinsic motivation, although granted both are more effective than no motivation at all. The difficulty here in increasing intrinsic motivation is that extrinsic goals can actually decrease intrinsic motivation.

There have been several proposed ways to increase intrinsic motivation in others such as verbal and non-verbal praise; realistic goals, varying content and difficulty levels are few amongst many. However, it is a completely different case improving intrinsic motivation within you. One proposed way of doing so is to induce a state of 'flow'. In a lecture on Positive Psychology course a guest speaker was invited to speak to the student about 'flow', the way he described it was 'playing a computer game for what seemed like five minutes but was actually lasted hours without you realising it'. The way I like to think of it is turning on a new TV show on Netflix and before you know it you've wasted five hours of the day and managed to watch about 7 episodes because you were so engrossed in the show. But how do we induce a state of flow into our studying? Certain elements are needed to achieve flow, what I believe to be the most important for studying are

- A balance of levels of skills and level of challenge
- Complete absorption in the activity (no distractions)

- Loss of self-consciousness
- Exhibition of confidence and positive mental attitude
- Appropriate focus maintenance

Although this is much easier said than done I believe if you can succeed in gaining a state of flow from achieving the above states of mind then you will intrinsically learn whatever it is that you're studying. There are however many things that prevent flow, including

- Fatigue
- Negative thinking
- Self-doubt
- Lack of arousal and challenge
- Goals too ambitious
- Pressure too high
- Influences outwith your own control

The ability to successfully self-motivate, thus creating a perfect learning environment, is an extremely complex task in itself however extremely effective if achieved. Other ways to motivate yourself are by setting your own personal goals, finding your source of inspiration and generally feeling positive about yourself. Below are some website links that may help you on your path to effective learning. Good luck.

[Brain Scape](#)

[Flow](#)

[Motivation techniques](#)

[Inspiration](#)

[Revision tips](#)

[Surviving exams](#)

[Willpower](#)

[In case you need a distraction](#)

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Webpage links

Jigsaw Classroom:

<https://www.jigsaw.org>

Elliot Aronson:

http://en.wikipedia.org/wiki/Elliot_Aronson

Video:

<https://www.youtube.com/watch?v=MpF9t-mr098>

The basic collaborative learning techniques:

<http://www.dso.iastate.edu/asc/supplemental/SIShowcaseCollaborative.pdf>

Technology as a learning workbench:

http://doc.utwente.nl/50888/1/rede_Collis_Moonen.pdf

Digital learning in the classroom:

<http://www.sciencedirect.com/science/article/pii/S0360131509002590>

Brain Scape:

<https://www.brainscape.com/>

Flow:

<http://www.psychologycampus.com/sports-psychology/intrinsic-motivation.html>

Motivation techniques:

<http://www.planetofsuccess.com/motivationtechniques/>

Inspiration:

<http://studyinspiration.tumblr.com/>

Revision tips:

<http://www.theguardian.com/education/2014/jan/08/five-secrets-of-successful-revising>

Surviving exams:

<http://www.nhs.uk/Livewell/teengirls/Pages/examsense.aspx>

Willpower:

<http://www.lifehack.org/articles/technology/25-apps-to-help-you-hack-willpower-download-memory-automate-tasks.html>

In case you need a distraction:

<http://justcuteanimals.com/>