TEACHING

**with ATL**

IN MIND

 **- IN THE IB DIPLOMA**

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**Teaching with ATL in Mind**

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*“Teachers are responsible for transmitting Tao,*

*imparting knowledge and resolving doubts”*

Han Yu (768-824)

**Introduction**

What is the aim of the IB Diploma programme?

In the broadest sense surely it is preparation for adult life? More specifically, preparation for university, polytechnic (as we would call it in New Zealand, maybe Technical College where you are), the job market or independent enterprise. And in order to achieve success in any or all of those four destinations are there any particular skills proficiencies that give significant advantage to those that have them?

Corporate leaders seem to think so - a 2007 survey of 400 hiring executives of major USA corporations found their top requirements of new recruits to be, in priority order:

1. Oral and written communication skills
2. Critical thinking and problem solving skills
3. Professionalism and work ethic
4. Collaboration across networks
5. Ability to work in diverse teams
6. Fluency with information technology
7. Leadership and project management skills

Knowledge of mathematics came 14th on the list just ahead of science knowledge and foreign language comprehension (Wagner, 2010; Trilling & Fadel, 2009).

Similarly the international Assessment and Teaching of 21st Century Skills (ATC21S) project, sponsored by Cisco, Intel and Microsoft, as a result of studies conducted in 2011 in Australia, Finland, Singapore and the USA advocate for ten essential skills for success in the 21st Century grouped into four categories:

**Ways of Thinking**

1. Creativity and innovation
2. Critical thinking, problem solving, decision making
3. Learning to learn, metacognition

**Ways of Working**

1. Communication
2. Collaboration (teamwork)

**Tools for Working**

1. Information literacy (includes research into sources, evidence, biases, etc.)
2. ICT literacy

**Living in the World**

1. Citizenship – local and global
2. Life and career
3. Personal & social responsibility – including cultural awareness and competence

(Binkley, Erstad, Herman, Raizen, Ripley & Rumble, 2010)

Similar skills lists have been developed by the International Society for Technology in Education (ISTE), the Organization of Economic Cooperation and Development (OECD) and the Departments of Education of the UK (*Learning Skills programme*), the USA (*Core Competencies programme*), Canada (Ontario), New Zealand, Poland, Belgium, Italy, Korea, Mexico the Slovak Republic, Spain, and Turkey (Ananiadou & Claro,2009).

21st Century skills, capabilities or fluencies have been endorsed by academic heavyweights like Robert Sternberg, Tony Wagner, Howard Gardner, Guy Claxton, John Stephenson, and Steve Higgins among others and are the subject of several books (*The Global Achievement Gap*, Wagner, 2010; *21st Century Skills*, Trilling & Fadel, 2009), and many resource packed websites (eg. [www.fluency21.com](http://www.fluency21.com), Lee Crockett).

If we accept that proficiency in these skills is vitally important for all our students by the time they finish school, we need to ask ourselves:

- do our students already have all these skills?

- if not can we teach them these skills within the Diploma?

- and if so how?

Unfortunately even some of the most basic skills of effective learning seem to be absent in many of today’s teenagers. Good note making has been positively correlated with academic achievement and yet when making notes from lectures or from text most students miss between 60 - 70% of the key points (Kiewra, 1985b, O’Donnell & Dansereau, 1993). Even when they have good notes many students still have great difficulty organising the information they have collected, 52% percent admit that their notes are disorganised and 61% report having trouble sequencing the ideas to make coherent sense (Rachel, Daigle, & Rachel, 2007). The only study technique employed by two thirds of high school students has been found to be simply rereading their notes and more than half of them do that reading the day before the test or examination. Of those who try to actively process the information they need, many do nothing more than recopy their notes verbatim and 50% use passive repetition of key points as their single study technique (Jairam, & Kiewra, 2009).

At the university level things are no better with up to 73% of university students reporting difficulties preparing for an exam and most having weak or ineffective strategies for processing information both in the classroom and in their own study (Rachel, et. al., 2007).

ATL at the Diploma level has been created to try to help make sure all our students, by the time they leave school, have all the skills of effective learning that they need to compete well in the worlds of academia, work and enterprise.

**ATL Skills**

In considering all the skills of effective learning it is first important to define the term ‘skill’ - “a set of strategies and techniques harmonised to achieve a single purpose which improves with practice” (MYP Principles to Practices – The New Chapter, due for release 2014).

As such a skill may be in use when manifesting a certain ability or talent but it is different from both. Proficiency in any skill can be increased through the deliberate use of techniques and strategies, feedback and challenge. The twin aims of any school-based ATL skills development programme need to be:

1. to teach students the ATL skills they need in order to succeed in their particular school environment, and
2. to give them ample opportunity to practice and improve those skills within the classroom environment.

As John Stephenson (Emeritus Professor, School of Lifelong Learning and Education, Middlesex University) points out, what we are looking for in the development of the lifelong learner is a move from *competence*, where the student is able to utilise their skills of learning with known content in known context, to *capability* where the student is able to use their skills with unknown content in a unknown context (Stephenson, 1990). With this in mind ATL at the Diploma level can be seen as a learning skills capability development programme.

At all three levels of the IB, ATL skills are grouped into 5 Categories:

* **Communication**
* **Social**
* **Self Management**
* **Research**
* **Thinking**

At the MYP and DP level these five categories are then expanded into ten clusters of skills:

**Skills Categories Skills Clusters**

Communication - Communication

Social - Collaboration

Self Management - Organisation

 - Affective Skills

 - Reflection

Research - Information Literacy

 - Media Literacy

Thinking - Critical Thinking

 - Creativity and Innovation

 - Transfer

With definitions as follows:

|  |  |
| --- | --- |
| **Communication**  | The skills of effectively exchanging thoughts, messages and information through interaction  |
|  | The skills of reading, writing and using language to communicate information  |
| **Collaboration**  | The skills of working cooperatively with others  |
| **Organization**  | The skills of effectively managing time and tasks  |
| **Affective skills**  | The skills of managing state of mind  |
| **Reflection**  | The metacognitive skills of re-considering what has been taught and learned by reflection on content, ATL skills and learning strategy use |
| **Information literacy**  | The skills of finding, interpreting, judging and creating information  |
| **Media literacy**  | The skills of interacting with different media to compare and contrast different representations of information  |
| **Critical thinking**  | The skills of critique of text, media, ideas and issues  |
| **Creativity and Innovation** | The skills of invention – developing original and novel ideas and products |
| **Transfer**  | Utilising skills and knowledge in multiple contexts  |

All ten skills clusters are seen as being of equal importance to a student’s performance at school but different subjects will lend themselves more to the practice of skills from some clusters over others. Teachers need to have discussions at the subject level, the department level and school-wide in order to decide which particular skills they want to focus on at which levels. The important thing is to look at this planning stage from the student’s point of view. Every student needs to gain proficiency in some of the skills within each skills cluster by the time they finish their Diploma. It does not matter so much where and when each skill cluster is utilised or particular skills practiced, but the cluster framework as a whole creates a complete profile of skills which research shows is significant for success in the 21st century.

Having decided which skills to focus on within their particular school/department/subject over which time period, teachers need to find examples of practices, techniques and strategies for 16-19 year olds which exemplify those skills within their particular subject. Once the key skills have been decided on the task will then be to design teaching strategies to develop those skills in senior students without increasing the burden on either teachers or students.

**Metacognition**

If we model academic performance skills from the best students in the world, those whose learning efforts are most productive and effective in helping them to achieve their desired academic outcomes and qualifications we find they all have one characteristic in common, metacognitive awareness (Hattie, Biggs, & Purdie, 1996). Whether metacognition is a skill, a collection of skills or simply a state of mind is debatable but the evidence is clear that establishing metacognitive awareness is a necessary precursor to focusing on and improving all (other) learning skills.

Metacognition means noticing present learning or thinking strategy use, analysing, comparing, experimenting, gathering feedback, making changes and implementing new strategies. These ‘executive’ functions need to be in place first before any specific learning strategy training takes place in order for any strategy training to be put into effective use by the student in their own studies. Without the meta-level skills being applied, direct learning strategy training has little impact and quickly disappears once the instructional context is changed (Kuhn, 2000).

Establishing metacognitive awareness creates what Carol Dweck (2008) calls her *Growth Mindset,* characterised by the twin beliefs:

1. that learning improvement is a function of effort and strategy use, and
2. that both of these things are in the student’s control.

Students with this awareness treat learning as a process requiring many different techniques and strategies depending on the subject and the context. They actively seek out options for every stage of the learning process, they try out different things and they notice what works and what doesn’t. They view any learning failure as a failure of process rather than that of the individual, they find better processes and apply them, they reflect on the results and they continually improve the success of their learning efforts (Derry, & Murphy, 1986, Hattie et al, 1996, Kobayashi, 2004, Yaworski, Weber, & Ibrahim,2000).

Hattie (2009) in a (meta) study of 800 meta-studies of factors effecting student achievement found that the most uniformly positive results in terms of academic engagement, understanding, transfer of skills and high performance in assessments come about through a focus in the classroom on learning strategy training in a metacognitive, self-regulated context in connection with specific content (Hattie et al, 1996).

**Teaching Strategies for Developing Metacognition**

Firstly, the presence of ATL and a focus on the skills of effective learning in the classroom will suggest to students three things:

1. that there exists a set of skills which underlie effective learning
2. that the best students at school have these skills, and also
3. that if they get better at these skills then their learning and hence their marks, grades, scores will improve.

These suggestions should arouse enough pragmatic self-interest on the part of the average student to at least test out these ideas and see if they work.

Secondly, through the Reflection phase of the IB Inquiry cycle using the skills set out in the Reflection cluster of the ATL skills, teachers can begin to focus students on developing metacognitive awareness through regular reflection on three things - **content**, **ATL skills** **proficiency** and **learning** **strategy use**.

What we are looking for is for students to start to become more aware of the ways in which they process information, find patterns, build conceptual understandings and remember key facts and ideas. Once they are aware that they *are* using techniques and strategies to perform even the most basic learning tasks they can then be encouraged to consider if maybe there are more effective or efficient ways they could use to achieve those same outcomes. Then they need to be encouraged to try new ways of learning and to evaluate the results.

**Task No 1. Develop metacognitive awareness through regular reflection on content, ATL skills and learning strategy use**

The easiest way to get them to do this is to ask them on a regular basis to reflect on:

1. **Content** – within every subject teachers will, as part of their normal teaching practice be getting students to reflect on their subject matter from the points of view of social, environmental, ethical implications and applications, future developments, global impact etc. depending on the subject, but the metacognitive reflection on content needs to be added to this and the essential question students need to be considering on a regular basis is:

**- “what I don’t understand yet is ………………?”**

If students can be encouraged to give feed-back to the teacher regularly on the things they have not yet understood this gives the teacher invaluable information which can inform the next lesson and make sure that all understandings are being attained. This can be done by discussion or on paper at the beginning or end of any lesson (or week, or unit) or even by Twitter. The teacher ask the students, each night, to read through all the material covered that day and to tweet to them either a thoughtful question on anything they did not understand out of the days lesson, or an “all OK” signal. That way every night the teacher then receives one tweet from each student and can see immediately if the understandings they were after were achieved or if there is any trend of misunderstanding. Any problems can then be addressed immediately in the next lesson before the lesson sequence continues. This step keeps all students up to speed and is also a very good way of beginning the process of putting responsibility for successful learning firmly in the hands of each student. It is then up to the students to check and make sure they understand everything as they move through the syllabus.

1. **ATL skills** – once the particular ATL skills that the teacher, subject, department or school have decided to focus on are made clear to students and strategies for teaching or developing those skill have been established then students can be asked on a regular basis to assess their present level of comfort and competence with those skills.

One method of assessing skills that has been shown to improve both self-confidence and self-motivation is self-assessment (Dweck, 1999). Using this technique students are relied upon to accurately judge their own competence or proficiency improvements in specified skills against generalised skills proficiency measures.

Given a clear proficiency development framework students are very capable of self assessing both their initial ATL skills and progress that they make towards mastery. One such framework is as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Level 1****Novice****- observation** | **Level 2****Learner****- emulation** | **Level 3****Practitioner****- demonstration** | **Level 4****Expert****- self-regulation** |
| Observes others performing tasks and using the skillHigh levels of scaffolding from teacher needed  | Copies others performance of the skillMedium level of scaffolding needed  | Can demonstrate the skill on demandMinimal teacher scaffolding required | Can teach others the skillNo teacher scaffolding required  |

(Dreyfus & Dreyfus, 2000; Berliner, 2004)

Greater detail is available in the ATL Literature Review and also in available TSMs.

1. **Learning Strategies** - each day at school, students are exposed to a range of learning methods or strategies employed by teachers in class and also employed by themselves in any directed or independent study and in homework. The third facet of developing metacognition involves students reflecting regularly on the effectiveness for them, of the learning strategies and techniques they are exposed to.

The real aim of the ATL programme is to get students to look at the strategies and techniques they are using every day to learn eg. how they take notes, review information, research, read, summarise, write reports and essays, memorise, and in doing those things also how they concentrate, focus, persevere, self-motivate etc. and to consider whether different strategies or techniques might work more effectively for them.

Every student’s most regular exposure to learning strategies is in class, every day. If we consider any one lesson to be a collection of learning strategies – reading, writing, discussing, listening, questioning, viewing, drawing, composing, practicing etc. then every lesson provides fertile ground for helping students start to notice which particular ways of learning work best for them. The aim of which is for every student to become more effective and more efficient in their learning which will in turn make their teachers jobs easier and also more efficient by reducing the teachers workload of re-teaching what was not understood well.

The easiest way for teachers to get students to start to notice learning strategies is to get them to reflect on the different ways in which they are taught on a regular school day and to consider which strategies work best for them. The key consideration for students is not which teaching methods they enjoyed most but which were most effective in helping them understand, remember and learn that particular subject matter. This in itself is a big step-forward in metacognitive development for students to separate pleasure from effectiveness in order to better identify their own best *ways* of learning. If this exercise is performed regularly (maybe once per week) then analysis of the information generated will then allow any individual student to build up a profile of themselves as a learner and enable them to more finely calibrate their own most effective ways of learning. The results of which can then be used by the student to improve their learning performance in all their own self-regulated learning – in homework and independent study for tests and exams. See metacognition TSMs for details.

The advantage of this method of self-calibration of preferred ways of learning is that it is not based on any, possibly spurious, questionnaire approach to what are called ‘learning styles’, it is based on a student’s real experience of success and the lack of the same in every-day learning. The research is very clear on this, there is no good academic evidence showing that diagnosing a student’s ‘learning style’ through any of the questionnaire methods currently available and then teaching them in the style thus revealed, makes any significant difference to their learning efficiency or effectiveness (Hattie, 2009). But the understandings gained about personal strengths and weaknesses as a learner from analysis of one’s own experience of learning are very significant. Once a student gets an idea about how they seem to learn best they can then start to utilise their strengths in their own independent study and homework and also develop their weaknesses by trying out new techniques and strategies.

Once metacognitive awareness is established all other ATL skill improvement becomes possible.

**ATL Skill Development.**

In general terms, the development of every ATL skill can follow the same seven steps.

1. Decide which particular and specific skills are going to be focused on in your classroom/subject/department/school
2. Make the skills to be focused on explicit by clear description of each skill and by using examples of high and low skills proficiency
3. Allow the students to self assess their perceived competence in the skills in question – from Novice to Master
4. Analyse the class results obtained looking in particular for any general skills deficiencies across the class
5. Develop mini-lessons or tutorials or find on-line exercises for students to complete to bring all students up to the same skill level
6. Build into subject lessons exercises which enable students to practice and improve the skills in focus
7. Ask the students to continue to self assess their proficiency up to mastery level

**Research – the Key Skill of Inquiry Learning**

If the most favoured teaching method at the DP level is, or is to become, inquiry learning (as is proposed in all IB publications reviewed for this project) then some of the most significant skills necessary for students’ success will be the Information Literacy and Media Literacy skills found within the Research Skills cluster. Inquiry learning means independent, self-regulated research and in the 21st century that means internet skills. The internet is fast becoming the most important information source in contemporary society and internet skills can now be considered as vital personal assets. Teenagers, although they are often seen to be the most prolific of internet users, are not all equally proficient in the internet skills they need for effective self-directed research. Teenagers often have less well developed search skills than adults, and only rudimentary techniques and strategies for simple searching, hypertext and hypermedia navigation.

Most students think of researching as putting key words into a search box which leads

 them to undervalue the importance of other methods (Nichols & Mellinger, 2007).

 “In the Internet world, the ease of finding *something* obscures the difficulty of

finding the *right thing*” (Gustavson & Nall, 2011, pg. 291)

To manage the data flow necessary to research well it is necessary for students to make sure they are proficient in all four modes of information seeking – *Searching*, *Monitoring*, *Browsing* and *Being Aware* (Bates, 2002).

**Browsing** (or surfing) - this is the skill that most students already have, in abundance, characterised by a general initial direction of inquiry followed by a willingness to be distracted in almost any other direction at all. The problem with browsing is that it often takes place when more directed research needs to be taking place and as such can be a major distraction.

**Being Aware** is more of an awareness or a critical literacy skill and essentially means being aware of all the unsolicited information in our environment and allowing our attention to scan it for relevance while not paying specific or direct attention to it. As a part of most Language and Literature courses students are encouraged to develop this skill.

The two key internet research skills most students need training in are *Searching* and *Monitoring*:

**Searching** – utilising Boolean Operators and Search Limiters to refine searches through search engines of the general (Google, Yahoo) type and the more specific or scholarly (university library, commercial database, Google Scholar) type.

**Monitoring -** employing RSS Readers to collect together all internet content (feeds) relevant to school subject lines of inquiry, scanning through all collected feeds on a regular basis looking for topics of value, finding the relevant information and downloading, sharing, posting or filing the important data.

If performed on a regular basis, especially in response to questions or lines of inquiry from teachers, both searching and monitoring can be vital strategies to keep students current and enable them to make relevant connections between their subjects and the world around them. Feeling overwhelmed by information is a common concern of students but by learning good searching and refining skills students can learn to narrow down the scope of their searching and cope with the volume they then produce.

Training in internet research skills will be vital for every student who is engaged in any form of inquiry learning or who uses the internet for the completion of any schoolwork. Teachers need to recognise this fact and build sufficient opportunity either within their subjects or as separate skills focused modules to bring all students up to speed with their internet skills. These skills along with communication and collaboration skills are the foundation skills of lifelong learning in the 21st Century.

**Task No 2: Establish RSS feeds for each subject**

Find the best on-line magazines, newspapers, blogs, discussion groups in your subject and get all students to set up RSS feeds to gather all the current subject related ideas. Don’t give them too many just pick two or three feeds to begin with. Students can then build up their own and share and recommend them between themselves as the year progresses.

**Task No 3: Teach Searching and Monitoring skills**

The people in your school best equipped to teach these skills are librarians. Get them to run research skills tutorials in lunchtimes or after school and make sure all your students attend. Ask them to create on-line tutorials on search limiters and Boolean searching.

Be aware that Internet research skills do not exist in isolation, they are always intimately linked to communication and collaboration skills and these can also be developed alongside any research skill practice.

**Communication and Collaboration**

One difficulty in trying to define key ‘Communication Skills’ for today’s senior students is that for them, life is communication. These students are part of the first ever digital generation, (in most parts of the world) they have grown up within the flow of information that is the internet and they communicate in a thousand different ways every day. Teenagers today often spend as much time engaged with social media as they do physically with their friends. Social media by definition involves the exercise of communication and collaboration skills. Any Facebook page represents a collaborative group and the interaction between these groups means that the personal distance between any two people on the planet is reducing daily.

Proficiency in communication skills both verbal and non-verbal, through writing and through other media, are highly sought after skills and have strong links with professionalism in all fields. Within high schools good communication skills are needed not only for success in every subject discipline but also to help form and maintain good interpersonal relationships both with other students and with adults be they teachers, administrators or parents (Gallagher, 1991, Lass, Ruscello, Bradshaw, & Blakenship, 1991).

**Every Teacher is a Language Teacher**

In order to communicate well it is advantageous for all students to have the same fluency in the language of discourse. In today’s multi-cultural school, those for whom the language of instruction is not their first language will usually be at a considerable disadvantage in both communication and collaboration situations. It is up to their subject teachers to try and ameliorate some of these difficulties.

Multilingualism, intercultural awareness and international-mindedness are cornerstones of an IB education. Multilingualism is now recognized as:

• a **fact** – more people live in places today other than where they were born than ever before in history

• a **right -** supported by declarations from UNESCO on mother-tongue entitlement and many governments’ legislation.

• a **resource** for helping to understand other points of view on any topic.

In order to promote communication and collaboration skills within a classroom situation it is important for teachers to allow for translation of difficult concepts and ideas between students with the same native language.

**Task No. 4: Create a glossary of technical terms for every subject in every language in use at your school**

 Every subject has its own technical terms and subject specific language containing words that are often difficult for speakers of other languages to pick up the meaning of. If all subject teachers were to take the words specific to their subject and have them translated into all the native languages present in their classroom and give these glossaries out to their students at the beginning of the year they could very simply help overcome some of the language difficulties which impact on the understanding of their subject. Often senior students who understand the subject and who speak the other languages can be used as resource people to develop such glossaries. More enterprising students have even turned such glossaries of terms into ‘apps’ for smart-phones.

**Communication, Collaboration and Learning**

The modern approaches of shared, situated and embedded cognition view learning as the result of a complex interaction of minds within specific cultural contexts and emphasise the social structures within which those interactions occur. These approaches necessitate consideration of all aspects of the environment in which learning occurs. In modern times this needs to include the pervasive influence of social media facilitated communication as an integral factor in of the cognitive activities associated with learning.

“Under this view, knowledge is not something that is handed down from one partner

to another. Rather, knowledge is coconstructed through interactions among collaborators.

This approach emphasizes that the whole of group behavior is more than the sum of its

 individual parts” (Lai, 2011).

 In today’s world social collaborative skills are practiced and developed both online and off but it is online where relationships are most numerous, complex and broadly based. With the development of Web 2.0 functionality, internet users are no longer passive recipients of information but active data creators.

Web 2.0 refers to the transition of web pages from static HTML production to more dynamic formats that allow viewers to utilise applications on the page, give immediate feedback and generate content of their own. A Web 2.0 site will usually allow users to interact and collaborate with each other in a ‘social media’ enhanced dialogue through open communication and the development of web-based virtual communities of users (Mostmans, Vleugels & Bannier, 2012).

In the USA studies show that that 57% of online teens (around 12 million people) create content for the internet. They create blogs and web pages for school, friends or organizations, they share original artwork, stories, photos, or videos online or they sample and remix other on-line content into new original creations.

* “33% of online teens share their own creations online, such as artwork, photos, stories, or videos.
* 32% say that they have created or worked on webpages or blogs for others, including those for groups they belong to, friends or school assignments.
* 22% report keeping their own personal webpage.
* 19% have created their own online journal or blog and 38% read them.
* Teens are much more likely than adults to blog and they are also more likely to read blogs.”

(Lenhardt & Madden, 2005)

The social influence of all this time on-line cannot be underestimated. For teenagers the internet means connection with others, it means social interactions whether by email, Facebook, Twitter, chat, blogs, games etc. Most teenagers today are immersed in one or more web-based social networks from the moment they get out of bed until the moment they go to sleep, 7 days a week, 52 weeks of year. This is today’s participatory social culture where creativity, communication and collaboration blended with media skills are the currency of value – sometimes called “media literacies”:

”A set of cultural competencies and social skills that young people need in the

new media landscape. Participatory culture shifts the focus of literacy from one

of individual expression to community involvement. The new literacies almost

all involve social skills developed through collaboration and networking”

(Jenkins, Purushotma, Clinton, Weigel, & Robison, 2006 p 4).

**Task No. 5. Within every subject, utilise the opportunities for collaboration and communication offered by the internet and especially by engagement with social networking platforms.**

Across the world students in IB schools are engaged in a wide range of collaborative projects in every subject. There are many places teachers can go for practical help in designing applications of 21st century skills in their subjects and developing collaborative projects for their students including:

**Edutopia** – many ideas from other teachers on integrating technology and project learning [www.edutopia.org](http://www.edutopia.org)

**ePals** – connects learners together either locally, nationally or internationally [www.epals.com](http://www.epals.com)

**ISTE’s National Education Technology Standards (NETS) for** **Students** **and Teachers** – teaching strategies and assessable standards for the development of 21st century skills [www.iste.org/standards/nets-for-students.aspx](http://www.iste.org/standards/nets-for-students.aspx) & [www.iste.org/standards/nets-for-teachers.aspx](http://www.iste.org/standards/nets-for-teachers.aspx)

**21st Century Fluency Project** – resources and lesson plans in many subject utilising digital resources with assessable standards aligned to national curricula [www.fluency21.com](http://www.fluency21.com)

**Partnership for 21st Century Skills** – integrating key digital skills into the teaching of academic subjects <http://www.p21.org/>

**Tech & Learning** – practical strategies for teachers to integrate digital technologies into teaching [www.techlearning.com](http://www.techlearning.com)

**Thinkfinity** – resources, lesson plans and examples of integrating digital technologies into most subjects [www.thinkfinity.org/lesson-plans](http://www.thinkfinity.org/lesson-plans)

As the next step in this project many resources will be made available to IB teachers to enable them to form international, collaborative, digitally connected groups of students in every Diploma subject.

**Thinking Skills**

This is probably the most difficult area to nail down in terms of skills. What is a thinking skill? There is no time in our lives when we are not thinking so we all have some skills in this area but I doubt whether many of those skills were deliberately learned.

Many notable academics have created classifications of thinking skills which attempt to cover the full breadth of all thinking: Ausebel and Robinson (1969), Presseisens (1991), Ashman and Conway (1997), McGuiness (1999), de Bono (2000), Ritchhart (2002), Kagan (2003), Moseley, Elliott, Gregson, & Higgins, (2005), Costa and Kallick (2009) to name but a few. Many proprietary programmes are available that aim to teach specific, individual thinking skills like Edward de Bono’s “Six Thinking Hats” and Art Costa’s sixteen “Habits of Mind” and there are also several cognitive skill training programmes available on-line – [www.lumosity.com](http://www.lumosity.com) and [www.cognisess.com](http://www.cognisess.com) all of which aim to improve thinking skills.

The ATL programme attempts to isolate the critical thinking skills needed for success in the Diploma and that framework can act as a starting point for a focus on thinking skills in the classroom. But the question has to be asked do we want our students to have a broader range of thinking skills or more depth in their thinking, and does a focus on the first necessarily achieve the second?

Through TOK, students gain an understanding of epistemology and philosophy of ideas and will improve their understanding and practice of thinking skills but developing thinking is not something that can be left to the TOK teacher. Just as every teacher is a teacher of language, every teacher is also a teacher of thinking.

Benjamin Bloom’s very familiar taxonomy of ‘Learning Domains’ (Bloom, 1965) can be translated into a hierarchy of thinking skills from lower to higher order:

**Bloom’s category Example of associated thinking skills**

Knowledge Memorisation Lower Order Thinking skills

Comprehension Explanation

Application Abstraction

Analysis Comparison

Synthesis Creation

Evaluation Judgment Higher Order Thinking skills

If our aim is to move students from lower order thinking to higher order thinking then our success in that endeavour is going to depend only partly on any deliberate skills acquisition, it will probably depend more on what thinking is required from them in the classroom. If the only thinking skills required of students in the classroom are *Memorisation* and *Explanation* then there will be no opportunity or incentive for students to develop any higher order thinking skills.

The best way to develop higher order thinking skills in students is to make sure such thinking is practiced regularly in every classroom.

Deliberate thinking in a classroom situation is best achieved through requiring students to come up with answers to questions. But obviously questions that only require remembering or explaining are going to produce lower order thinking, it is only higher order questions that will produce higher order thinking.

If teachers want to develop these skills in their students it is going to be necessary for them to plan each unit as a succession of questions they can ask their students, the answers to which will lead those students inexorably to the required subject matter objectives. This is going to require more lesson design work than simply providing students with all the answers but will be much more rewarding for the student in terms of developing the skills of effective thinking. This process as described, of course, is one simple form of inquiry learning, the backbone of all teaching in the IB.

**Task No.6 – Break subject matter objectives down into a sequence of interrelated ‘higher order’ questions**

The new DP Unit Planner has been designed with the idea in mind of developing curriculum objectives through a series of interconnected questions.

**Self- Management**

This skill Category breaks down into three separate Clusters:

 **Organisation** – managing time and tasks effectively

 **Affective Skills** – managing state of mind:

 **- Self Motivation**

 **- Resilience**

**- Mindfulness**

**Reflection** – developing metacognitive skils

**Metacognitive** skill development through reflection has been dealt with previously in this document.

**Organisation**

The most obvious skill set needed to be successful not only in the Diploma but at all levels of education is that of organisation and within that the particular skills of time management.

Students at both secondary and tertiary levels are very aware of their own deficiencies in this area but often do not have effective strategies to overcome them (Weissberg, Berentsen, Cote, Cravey & Heath, 1982). Good time management is a feature of self-managed or self-directed learning (McCombs, 1986), it can alleviate stress (Lay & Schouwenburg, 1993), increase academic performance (Campbell & Svenson, 1992) and contributes significantly to successful ‘strategic’ study (Kirschenbaum & Perri, 1982).

If we expect our students to be well organised and punctual, to work methodically throughout the year and to meet all deadlines without last minute panic, then we must model strategies to help them achieve this goal.

**Task No. 7: Coordinate all assessments dates for assignments, tests and exams across all subjects in the Diploma to model good organisation and avoid unnecessary student stress**

If all Diploma teachers co-ordinate their deadlines for students so that any individual student’s assessments are well spread throughout the school year, if teachers help their students learn how to break down assignments into achievable steps and timeline each step, plan out review and study for tests and exams and build study timetables then much poor time management will be alleviated.

Time management is not something we can assume that students will be good at, like all ATL skills it is a specific skill which must be taught.

One reason that has been suggested for poor time management amongst students is *perceived control of time* (Macan, Shahani, Dipboye & Phillips, 1990) also called a *time attitudes factor* (Britton & Tesser, 1991). Students who feel OK about saying “No” to people are able to select against unprofitable ‘TimeConsuming’(Cemaloglu & Filiz, 2010) activities and for ‘Time Management’ and ‘Time Planning’ activities. These students report greater work satisfaction, less overload, more efficient thinking, more enjoyment out of studies and more perseverance. Other students feel that control over their time is out of their hands and consequently feel more stressed, they procrastinate more and they produce poorer quality work. In these situations it is not the lack of time which is the key factor it is the perception of control.

Performance improvement in this area comes partly out of time management strategies themselves and partly out of attitude and perception both of which can be influenced by affective skill development.

**Affective skills**

In addition to the meta-cognitive and organisational skills mentioned above it is also advantageous for students to learn any skills that will enable them to gain some control over their mood, their motivation and their ability to deal effectively with setbacks and difficulties. One of the characteristics of self-regulated learners is their deliberate use of strategies to help them generate self-belief and an intrinsic motivation to learn. They use delayed gratification and positive self-talk to generate self-motivation, they exhibit good impulse control and to improve learning performance often use attention focusing tactics to screen out distractions and increase concentration (Pressley & Woloshyn, 1995; Pintrich, 2000; Ryan & Deci, 2000; Zimmerman, 2000).

The question is, are these techniques and strategies teachable and if so how can DP teachers incorporate them in their teaching?

Evidence of the *teachability* of affective skills comes from research into:

* attribution retraining to change causal attributions for learning failure which has resulted in improvements in reading persistence (Chapin & Dyck, 1976, Fowler & Peterson, 1981), higher levels of completion and higher scores with computer assisted mathematics instruction (Okolo, 1992), increases in mathematics scores (Horner & Gaither, 2004), improvements in motivation (Koh, 2008), improvements in reading comprehension and retention of improvements over time (Berkeley, Mastropieri & Scruggs, 2011);
* relaxation training which has helped reduce exam anxiety and increase grades (Hembree, 1988),
* developing an internal locus of control which has improved academic performance (Nowicki, Duke, Sisney, Stricker & Tyler, 2004), as has
* improving motivation, performance and self esteem (Meuller & Dweck, 1998, Niiya, Crocker, and Bartmess, 2004) and
* improving achievement motivation (Dweck, 2007).

Affective self-management skills are teachable and they can make a huge difference to a child’s motivation and resilience. Self-Management skills training is the newest addition to the ATL portfolio of skills and has within it the potential to address some of the most critical influences on a student’s learning which lie at the heart of helping students to achieve the characteristics of the learner profile.

At the Diploma level the particular affective skills needed to handle the challenges of higher learning are grouped into three key skills sub-sets: **Resilience, Self-motivation** and **Mindfulness**. These groupings are themselves still very conceptual and it is recognised that, depending on how it is taught, each subset could contain elements of all the other affective sub-sets. Such is the nature of Affective Skills.

**Resilience**

Resilience appears to be the affective concept that is most inclusive of almost all other desirable affective elements of the successful Diploma student. The resilient learner is mindful, persevering, emotionally stable and self-motivated. Through focusing on developing resilience with respect to learning teachers may find that many other important affective skills are practiced and developed as well.

The optimal conditions for learning do not seem to be created by goals that are too easy or too difficult but by goals that are challenging but achievable (Csikszentmihalyi, Rathunde and Whalen, 1993). For the resilient learner any challenge entails the possibility of failure and frustration but it is this possibility that makes the challenge interesting and intrinsically motivating (Alfi, Assor and Katz, 2004). For the more ‘helpless’ student the anticipation of even temporary failure can bring about a slip into helpless or self-handicapping behaviour. This type of academic underachiever has been shown:

“typically to anticipate failure in a task and therefore to concentrate on creating

 behavioural excuses for it instead of formulating task-oriented plans”

(Nurmi, Onatsu and Haavisto, 1995, p. 189).

It is in response to failure that the clearest distinction between the resilient and the more helpless student can be found. The resilient individuals attribute failure to a lack of effort and take effective remedial action but the helpless individuals tend to attribute failure to a lack of ability about which, they believe, there is nothing they can do (Dweck, 1999).

The literature reviewed reveals a consistent dichotomy between what might be called *healthy* and *unhealthy* reactions or responses to failure situations.

The *healthy* response to failure seems to be for the individual to:

1. find the facts,
2. take responsibility for his/her own actions
3. make changes to his/her process or strategy
4. have another go.

This type of reaction has been termed *failing well* (King, 2009).

**Task No. 8: Create a classroom climate where students feel safe to fail**

In order to promote *failing* *well* as a concept to help develop resilience it is vital to establish a climate in the classroom where students feel safe to fail. This can be done by:

1. desensitizing students to the word *failure* by defining it simply as “setting a goal and then not achieving it”
2. removing the emotional baggage that often goes with the word failure by focusing on failure as a “verb not a noun”, as action, not position and a process that we all need to go through in order to achieve success
3. actively practicing the *failing* *well* strategy outlined above

The greatest hindrance to the development of resilience in the classroom is probably the idea of getting things ‘right first time”. If learning was seen as a process of gradual improvement through reflection on mistakes then maybe students would be more inclined to ask questions, take risks, be more adventurous in their thinking, and be more creative with their ideas. Of course, in order to set up such a climate it is the teachers who need to take risks, be adventurous in their thinking and planning and be prepared to learn from every mistake. Modelling *failing well* is the best way to promote it.

Schools that are most effective at promoting the resilience of their students are those that provide opportunities for children to make mistakes and learn from them, to develop problem solving skills, autonomy, a purposeful, constructive and optimistic outlook on the future, and effective communication and relationship skills (Benard, 1993). To do this schools need to run programmes that promote the development of an internal Locus Of Control in students, as well as self efficacy, optimism, a sense of personal responsibility and the ability to learn from mistakes (McMillan and Reed, 1994).

**Self-Motivation**

As Alfie Kohn points out in “Punish by Rewards” no one can ever motivate anyone else, the only true motivation is self-motivation (Brandt, 1995). All we can ever hope to do as teachers is to arrange the variables that we have some influence over to help self-motivation to arise and then to facilitate its development.

As such self-motivation is not really a skill as defined but all teachers know that motivation is probably the core of successful learning. A motivated student is easy to teach and a motivated student learns well but can students learn to have some control over their own self-motivation? Motivation to learn has been shown to be closely related to the skills of ‘learning to learn’ and perceived self-efficacy for learning (Warr & Downing, 2000; Parsons, Hinson & Brown, 2001). Self-efficacy is an important factor in both academic achievement (Bong, 2001, Ning & Downing, 2010) and academic motivation (Bong & Clark, 1999).

“People with high levels of self-efficacy are more likely to persevere in the face of

 difficulties, more likely to demonstrate intrinsic motivation when engaged and

performing a task, and less likely to feel disappointed in the face of failure. They are

less likely to feel stressed and more frequently perceive a difficult situation as

challenging as opposed to difficult” (Prat-Sala & Redford, 2010, p285).

Interestingly the research into intrinsic motivation shows that classroom environments that actively help develop students’ autonomy and self direction are also those that increase students’ intrinsic motivation and help improve their efficacy as learners (Deci, 1975) whereas classroom environments which utilise tangible rewards for performance outcomes tend to undermine intrinsic motivation (Deci, Koestner & Ryan, 1999). Assessment of the self against the self is much more likely to improve self-confidence and generate intrinsic motivation than assessment of the self against others (Dweck, 2007). If the assessment process in the classroom involves comparing students with each other on the basis of performance outcomes in an effort to improve results it is unlikely to produce the intrinsic motivation necessary to do so.

Teaching students the skills of self-assessment in a staged process (see Self-assessment TSM) gives them training in the vitally important skill of accurately gauging the quality of their own output, generates more self-confidence and intrinsic motivation and ultimately reduces the burden of marking on the teacher. Once students have demonstrated proficiency in self-assessment they can be given many opportunities to do so.

**Task No. 9: Teach students how to self-assess the quality of their own output**

The strongest self generated motivation for learning occurs when three factors are present – autonomy, mastery and purpose (Howard, 2010).

**Autonomy** means authority and responsibility – having the authority to make decisions that affect your own life and taking responsibility for the consequences of your own decisions, whether good or bad. This is the exercise that students need practice in, in order to prepare well for adulthood. Within a school environment devolving both authority and responsibility to senior students means key adult authority figures being willing to relinquish some power and trusting students to manage it well. It means a school administration willing to embody the principles of the Learner Profile and take a risk with sharing power. In the schools that do this well, senior students are actively and autonomously involved in many aspects of the school administration eg. being spokespeople on school committees, Boards of Trustees or Governors, running the school newspaper/website organising cultural/musical/dramatic school productions, coaching sports, music, study classes, running school assemblies, taking roll calls of junior students, mentoring students in need, organising student committees, designing and implementing fundraising and entrepreneurial initiatives as well as social action and charitable projects in the community, canvassing student opinion on key issues and presenting ideas directly to the senior management team. These schools create an expectation within all students that they will take serious responsibility within the school structure once they reach senior years and are prepared to devolve trust, power, authority and responsibility to bring this about. This creates a climate of adulthood in senior years classes structured around appropriate student role models for all younger students to look up to. The motivating effect on all students of all ages within a school of these types of power-sharing initiatives is immeasurable, and they also give senior students invaluable practice in a safe environment of some of the adult roles they must take on as soon as they leave school.

The other area where students can practice **autonomy** is in the classroom. Through initiatives like the metacognitive development exercises mentioned previously and the direct teaching of ATL skills students can start to take responsibility for the effectiveness of their own learning. If teachers make it clear to students that improving their learning effectiveness is one of their academic goals and if teachers are prepared to provide the training and resources for students to be able to achieve that goal then teachers also need to create opportunities for students to practice taking responsibility for their own learning in the classroom. Teachers need to turn as many lessons as possible into completely independent learning exercises which students who have demonstrated good self-regulated learning skills can then utilise either inside or outside the classroom.

**Mastery** means achieving high competence in a set of skills, in this case ATL skills. Improving the students ATL skills will impact on the efficiency and effectiveness of all their school subject learning creating more self confidence and self-motivation. This approach requires teachers to maintain a dual focus in the classroom on both content and process and to see practicing and improving ATL Skills as being an important ingredient of every lesson. The system for self assessment of ATL skills mentioned earlier has a progression of ATL skills proficiency which moves from *observation* (the Novice) to *self-regulation* (the Master*)*. Becoming a self-regulated learner then, is not seen as the achievement of a single skill, it is seen more as a level of proficiency of all the important skills of learning effectively and efficiently. One key role for teachers in this environment is to create opportunities for students to demonstrate proficiency in learning at the self-regulated level – to demonstrate their **Mastery** through independent, autonomous action.

**Purpose** simply means answering the question - why? For the student that means “why am I learning this? There are many tacks teachers can take to answer this question some which have more motivational power than others. Development of purpose for studying and learning around external goals like gaining qualifications, getting to university, gaining a good job, living up to parental or teachers expectation etc. are useful for planning but unfortunately not particularly motivating in the present moment (Dweck, 1999). The more motivating reasons are always internal or intrinsic. In many learning situations purpose can be generated from real world relevance through connection to situations, problems or events in the community or world-wide. Purpose can also be found through joining a community of interest and communicating with a team of like minded individuals in a collaborative on-line project. In learning situations where these connections are not available teachers can help students find purpose through intrinsic motivators like:

* to feel satisfied, proud of yourself
* to challenge yourself and see what you are capable of
* to get a measure of your progress to date
* to gain useful knowledge and skills
* to develop and increase your intelligence

In the new (2103) version of the Learner Profile there is dispensation for schools to use the word Courageous rather than Risk Taker. I always define *courage* to students as “doing something that you know is going to be hard” and I put some school learning and most assessments and exams into this category. Students know that achieving well at school is going to be hard, they know it is going to take a lot of work, focus and determination to achieve their goals and one way to help them with this is to talk about courage. Find some great examples of courage, draw out the characteristics of courage and connect courage with the work it takes to get the Diploma. For generating purpose, practicing courage seems to work very well for some students.

**Task No. 10: Focus on creating opportunities for autonomy, mastery and the development of purpose**

**Mindfulness**

Mindfulness training involves the practice of mental relaxation and in an educational context has been found to improve the functioning of the brain (Brown, Ryan and Cresswell, 2007) with improvements being reported in reading comprehension and working memory capacity (Mrazek, Franklin, Phillips, Baird & Schooler, 2013), digital memory span (Chambers, Lo, & Allen, 2008) and visual/spatial processing efficiency (Kozhevnikov, Louchakova, Josipovic & Motes, 2009).

Mindfulness techniques most useful for Diploma students will be elaborated in TSMs subsequent to this document but usually involve setting aside a certain time for students to sit quietly and relax in a safe environment. The aim of the exercise might be to teach them how to relax or deal with stress, pressure or exam nerves but the mindfulness part of that exercise will simply be about helping them to become more perceptually aware. Mindfulness means simply becoming more aware of your own perceptions as they happen and your thinking as it occurs. Helping students learn how to ‘stay in the moment’ is the secret to their learning to overcome distractions, increase attention and improve concentration (Brefczynski-Lewis, Lutz, Schaefer, Levinson & Davidson, 2007).

Most students at all levels of schooling and most parents as well acknowledge that the ability to deal with distractions, focus and concentrate on schoolwork is probably the single biggest issue to overcome to improve academic performance. Of all the skills we could possibly help our students with, learning to concentrate has to be one of the most important and may be worthwhile putting some training into developing.

**Task No. 11: Look into the possibilities of improving concentration through mindfulness exercises**

Mindfulness is probably the one particular skill of all the ATLs that is most likely to be seen by some teachers as ‘flaky’, unsubstantial, unscientific, touchy-feely etc. and will probably be the one skill that teachers are least likely to want to have anything to do with. In most schools though there is at least one counsellor and these are the people who might have an interest in mindfulness simply because of its extensive use in therapy. If they are interested in using a good therapeutic technique to help improve focus and concentration counsellors can be engaged to run courses or sessions for students, particularly for those who have difficulties in this area.

**Pedagogy and Andragogy**

Pedagogy is defined as “the art and science of teaching children” (Ozuah, 2005, pg. 83) in contrast to andragogy as “the art and science of helping adults learn” (Knowles, 1980, pg. 43).

In consideration of teaching strategies most suitable for 16-19 year olds it may be useful to move away from pedagogical approaches towards more andragogical approaches in order to design teaching more appropriately match the developmental stage of the students.

According to Knowles (1998), pedagogy makes the assumptions that children as learners:

* are dependent on teachers
* prefer learning that is subject centred
* respond well to extrinsic motivators
* do not have enough life experience to be relevant to learning in the classroom

In contrast andragogy makes the assumptions that ‘adult’ learners

* prefer to be responsible for their own learning and involved in the [planning](http://en.wikipedia.org/wiki/Planning) and [evaluation](http://en.wikipedia.org/wiki/Evaluation) of their instruction
* can use their own life experience as a rich resource for learning
* prefer learning that is [problem](http://en.wikipedia.org/wiki/Problem)-centered rather than content-oriented
* respond better to internal rather than external motivators
* need to understand the reason for and importance of, all their learning
* are most interested in learning topics which have immediate [relevance](http://en.wikipedia.org/wiki/Relevance) to their present life and goals.

It is interesting to consider Diploma students and think whether their attributes as learners fit a more andragogical or pedagogical teaching structure. And also to consider that if the Diploma is a preparation for further learning as an adult whether getting them used to adult ways of learning while still at school would give them an advantage.

Certainly inquiry learning as described in most IB documents is much more an andragogical teaching strategy than a pedagogical one.

**Inquiry Learning and Inquiry Teaching**

In all IB publications surveyed for this project, the inquiry learning cycle:

sustained inquiry

principled action

critical reflection

is recommended as the basis for both the design and the implementation of classroom teaching practice in the Diploma.

The questions that have to be asked then are:

- how much teaching at the Diploma level world-wide is presently undertaken using the inquiry method?

- could the contribution of inquiry learning to the full spectrum of teaching methods in use at Diploma level at your school be increased?

- If so how?

Teaching in IB programmes is:

* based on **inquiry**
* **f**ocused on **conceptual understanding**
* developed in local and global **contexts**
* focused on effective teamwork and **collaboration**
* **differentiated** to meet the needs of all learners
* informed by **assessment** (formative and summative)

(Towards a Continuum of International Education, 2013)

All these criteria for teaching could be achieved by well designed inquiry methods, of which there are many, but the one sticking point might be “informed by summative assessment”.

Which is significant because it is absolutely true that all teaching *is* informed by summative assessment.

Simply put, if a grade on a summative assessment is the main measure of a student’s success then the teaching techniques and strategies chosen by teachers will be those that they think will give their students the greatest chance of achieving their best possible results in that summative examination. That’s what good teaching is. And if that summative examination requires a knowledge of facts and theories but not an understanding of their derivation or their practical application or example in today’s world then the teaching will reflect that reality. Conceptual, contextualised, collaborative, inquiry based teaching will only be favoured by teachers when DP summative assessments require conceptual, contextualised understandings, developed collaboratively and inductively, as answers to examination questions.

Within the IB, assessment review is always a part of the regular process of curriculum review. Several subjects (Business Management, Philosophy, Global Politics, TOK, Biology, Chemistry, Physics, Design Technology, Visual Arts, Theatre) have been recently reviewed and both the subject matter and the summative assessments have been made somewhat more conceptual. All subjects are in some phase of their review cycle and over time, in line with current ideas of conceptual, inquiry based learning, will all be changing their summative assessment requirements to suit.

Given the present situation and these changes which are coming over the next few years, the most important question for DP teachers has to be how to design teaching practice now to produce effective inquiry learning under today’s conditions, given the quantity of important information in each subject area which needs addressing, the pressure of ongoing formative assessment and the culminating measure of a student’s academic performance being a terminal examination-based summative assessment?

Inquiry learning and teaching takes many forms, Structured Inquiry, Guided Inquiry and Open Inquiry (Staver and Bay, 1987), Teacher Inquiry and Learner Inquiry (Wideen, Mayer-Smith, & Moon, 1998), Process-Oriented-Guided-Inquiry-Learning, POGIL (Lee, 2004) as well as in other methods which have their own structure but owe their basic design to inquiry learning like Experiential Learning (Kolb, 1984), Problem and Project Based Learning (Prince, 2004), Case-Based (Fasko, 2003) and Discovery Learning (Prince & Felder, 2007).

The important practical requirement for teachers is not adherence to any particular model, the important thing is to make sure your students are inquiring, that is finding their own information and constructing their own understandings, as often as possible in your classroom.

Inquiry experiences require students to have access to all the information they may need to achieve the learning objectives set for them by teachers and the research skills necessary to find it. One part of the planning work for teachers is designing the sequence of questions to lead students from where they are to where you want them to be, the second part is finding the best resources for them to use to find their way there, the third part is teaching them the information and media literacy skills they need to use to find the answers.

When I was at school, (roughly a million years ago) the only two places a student could find good quality subject based resources were inside the head of the teacher and in the textbook. Not anymore. There are at the present moment over 100 good quality, student friendly, school subject based websites available for teachers to access for reputable, curriculum based school subject matter eg:

[www.khanacademy.org](http://www.khanacademy.org) - really clear clips explaining every part of most subjects

[www.brightstorm.com](http://www.brightstorm.com) - great videos and much more in Maths, Science and (American) English

[www.getrevising.co.uk/resources](http://www.getrevising.co.uk/resources) - all subjects at all levels, great new shared resources arriving daily from students around the world

[johndclare.net](http://johndclare.net)and[spartacus.schoolnet.co.uk](http://www.spartacus.schoolnet.co.uk/)– History sites, all countries, all ages

[s-cool.co.uk](http://s-cool.co.uk)and[bbc.co.uk/schools/gcsebitesize/](http://www.bbc.co.uk/schools/gcsebitesize/)- good resources for all subjects

[quizlet.com](http://www.quizlet.com)and[easynotecards.com/index](http://www.easynotecards.com/index) - flash card makers for most subjects

[www.studyblue.com](http://www.studyblue.com) - notes, flashcards, games in every subject, share resources

[www.languageperfect.com](http://www.languageperfect.com)– competitive, game based subscription site for learning most languages

[www.sparknotes.com](http://www.sparknotes.com) - English Literature – analysis of characters, themes, plots, of books, plays, Shakespeare

[www.swipestudy.com](http://www.swipestudy.com)– free flashcard memory study games for most subjects – sent to your phone!

[www.rod.beavon.clara.net/chemistry\_contents](http://www.rod.beavon.clara.net/chemistry_contents) – good explanations of most Chemistry topics

[www.enotes.com](http://www.enotes.com) – study guides, discussions, Q&A in most subjects

[www.universalteacher.org.uk](http://www.universalteacher.org.uk) – English literature and English language, many resources

[www.bibliomania.com](http://www.bibliomania.com) – English literature, study guides, book notes and biographies

[www.quia.com](http://www.quia.com) – thousands of self-test quizzes in over 300 subject catagories

Also some sites have been set up to make the job of finding the most suitable websites for your subject at your level much easier. Have a look at [www.topmarks.co.uk](http://www.topmarks.co.uk) – this is a search engine for school subject based websites. When you go to this site you choose your subject and your level (it is very English so you need to know that the IB Diploma is at the same level as ‘A-level’ or ‘Advanced’) and it will find all the websites that will satisfy that choice. Also [www.taolearn.com/students.php](http://www.taolearn.com/students.php) contains links to around 50 different websites students can use to learn from and[www.marktreadwell.com/Digital\_Resources](http://www.marktreadwell.com/Digital_Resources) has a huge catalogue of digital resources for teachers, in all subjects.

If we want students to take responsibility for their own learning it is important that they find one or two websites that suit them for every subject they study. Then if they are not understanding something the way a teacher is explaining it they always have somewhere to go to get an alternative presentation of the same material. The teacher’s role then is to be able to recommend some places to go to find the subject matter under study.

This means that every teacher needs to be familiar with several websites that deal with their particular area of expertise at the Diploma level and to know those websites well enough to design units of work around the content found there - this is where tools like Topmarks.co.uk can be very useful.

Of course the school must also have the infrastructure in place to support one device and one high speed internet connection per 3-4 students at the very least. One internet capable device per student in the classroom is not necessary and can even serve to increase isolation and decrease collaboration, communication and recall (see Sugata Mitra <http://www.ascilite.org.au/ajet/ajet21/mitra.html>or video <http://www.ted.com/talks/lang/en/sugata_mitra_the_child_driven_education.html>). One device per group of 3 or 4 students works much better as students are still practicing communication and collaboration and learning from each other.

If such internet access is available then with the resources available today every teacher can set up inquiry learning experiences for students in every subject.

**Task No. 12: Introduce some simple, internet based, inquiry learning exercises into your daily teaching**

To introduce inquiry learning teachers need to:

* Pose questions, outline problems, set challenges, give clear measurable objectives
* Put students into small groups (3-4 students)
* Assign roles – only one person on-line in each group
* Enable them to connect to the best subject based internet resources
* Focus the students on both the answers they are finding and the research skills they are using
* Allow for roles rotation within each group
* Facilitate their journey

As well as being one of the most self-motivating processes of learning for most students, inquiry learning also has the advantage, if well managed, of teaching them the skills they need to become self-regulated learners.

**Developing Self-Regulated Learners**

Self-regulated learners have learnt how to:

* set learning goals
* plan out their study
* ask good questions
* self-interrogate as they learn
* generate motivation and perseverance
* try out different learning processes
* self-monitor the effectiveness of their learning
* work to deadlines
* reflect on achievement and
* make changes to their learning processes where necessary

(Zimmerman and Schunk, 1989, Wolters, 2011, De Bruin, Thiede & Camp, 2011)

Self-regulated learners have greater levels of self-efficacy (Kistner, Rakoczy, Otto, Dignath-van Ewijk, Büttner, & Klieme, 2010), perform better on academic tests and achieve higher academic performance than students without those same skills (Shunk & Zimmerman, 2007).

To develop self-regulated learners teachers can either teach the skills mentioned above through ATL within their subjects or can adopt teaching methods which require the practice and effective use of these skills, or both.

Teachers can be catagorised into three groups based on the degree to which they tend to regulate the learning of the students in their classes – from *Strong* to *Shared* to *Loose regulation style.* Students also can be catagorised into three groups based on their level of self-regulation skills from *High* to *Intermediate* to *Low* skills. In the intersections of these two scales we find plenty of potential for ‘destructive friction” – eg. when a high skills student is with a strong regulating teacher or a low skills student is with a loose regulating teacher - but within this intersection there is also potential for a style of teaching that meets all students’ needs.

|  |  |
| --- | --- |
| **Level of Student** **Self-Regulation Skills**  | **Style of Teacher-Regulation of Learning** |
|  | Strong  | Shared  | Loose  |
| High  | Destructive friction  | Constructive friction  | Congruence  |
| Intermediate  | Destructive friction | Congruence  | Constructive friction  |
| Low  | Congruence  | Constructive friction  | Destructive friction  |

(Vermunt & Verloop, 1999)

Only the ‘Shared’ style of regulation of learning in the classroom has the potential to work well with all three levels of students skills.

**Shared Regulation:**

* teacher provides access to resources, skills training, questions, problem statements, concepts, ideas, learning outcomes
* students actively engage with information in order to answer questions, follow leads, solve problems
* students thinking engaged, teacher as guide and support

Adopting a *shared* regulation style in the classroom appears, within this model, to be an excellent means to achieve a growth in self-regulated learning skills within students, with the provisos that:

1. the self-regulation skill levels of the students are being constantly monitored, particularly to identify when any individual reaches a high level proficiency,
2. independent study materials and resources are available for any such student to use once they reach demonstrable high level proficiency in self-regulation in order to progress their learning and avoid any possible destructive friction, and
3. ATL skills training is available for all the students identified as low in self-regulation skills

If the focus of teaching is on the development of the skills of self-regulated learning and the pedagogy (andragogy) employed is one of *shared* regulation of learning then the student will be enabled by their school learning experience to gain the capabilities needed to be a lifelong learner.

**Task No. 13: Try running a lesson using the ‘shared regulation’ model, notice the SRL skill levels of each student**

**Teaching with ATL in Mind**

The basic premises underlying all this work are that:

* if students have training in ATL skills as a part of their normal DP education then both the efficiency and effectiveness of their learning will improve and teachers will be able to cut down on the amount of re-teaching they engage in
* students who get their ATL skills up to the self-regulated level will be capable of completing much of their school work as independent learners and thus cut down necessary class-time and reduce the amount of direct teaching that is needed
* students who get their ATL skills up to the self-regulated level will be more competitive in the world of employment and enterprise and will also perform better at universities and technical colleges
* capable, self-regulated students will remain both challenged and motivated to learn at school
* students who have been empowered at school to practice roles with authority and responsibility will be more capable of adopting adult roles when they leave school
* teachers who focus on teaching ATL skills using their subject matter as the content to practice ATL skill development on, will find the understanding and retention of their subject matter will increase
* teachers who teach using well designed inquiry learning methods will be able to engage their students with higher level thinking and will be able to move the intellectual level in their classroom up Bloom’s taxonomy
* teaching will become more interesting

And the over-arching premise is that the primary aim of an IB education is the development of the attributes of the learner profile within each student:

Students who practice inquiry learning become more **inquiring** and more **knowledgable**

Students who practice high level thinking become high level **thinkers**

Students who practice communication and collaboration skills in local and global teams become more effective **communicators**, more **caring** and more **open-minded**

Students who practice metacognitive skills become more **reflective** and more **principled**

Students who practice resilience, self-motivation and mindfulness skills become more **courageous**, more motivated and more **balanced**

 **Task No. 14: Make developing the attributes of the learner profile through skills based guided inquiry teaching your highest objective.**

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