Embracing a focus on transferable skills

Transferable skills are 21st century skills

We have inherited an approach to mass education that was based on Prussian military training and British factories, designed to produce citizens who would faithfully reproduce inherited knowledge and obey established rules. The way we teach and assess learners still tends to focus on what has been predetermined, usually because it is easily measurable. This is not useful when it comes to assessing the kinds of higher order thinking skills valued in our knowledge economy.

The skills that enable us to succeed in the knowledge economy of the Third Industrial Revolution, and to face the challenges and opportunities presented by machine learning in the Fourth Industrial Revolution, are not the skills our current education system focuses on. In order to thrive in the 21st century our learners need to become multi-disciplinary investigators and life-long learners; highly adaptive problem-solvers; technology-literate knowledge workers; shape-shifting, risk-taking innovators; and courageous, independent thinkers. This means that we need to move beyond a focus on prescribed content to explore the skills that learners need to deal with any content in any context. These are the transferable skills that enable learners:

- to think critically;
- to innovate without fear of failure;
- to communicate clearly and confidently;
- to collaborate dynamically and participate actively in productive dialogue;
- to risk small, regular, ad carefully designed experiments;
- to persevere and not give up when a solution isn't immediately obvious; and
- to adapt to change with as little anxiety as possible.

Some have referred to these as 21st century skills.

We call them transferable skills because they are not limited to any subject or context. They can be transferred from subject to subject, from language to language, from a familiar situation to an unfamiliar one, from electives to the core, from informal learning in the community to formal learning at school, and from working things out in class to working them out in everyday life.

A change in focus

When you ask school management and teachers what kind of learner their school is trying to produce, and then ask them to compare that answer with what all the coaching of learners for exams achieves, they often see that there is only a low correlation between the two answers. As much as they may be able to identify the skills that are most crucial for thriving in the 21st century, these skills are not seen as the priority of 'the system' they perceive themselves as embedded in.

Universities keep telling us that the matric exam gives no indication of how a learner will perform at university. There is no correlation at all – except perhaps for individual learners who have succeeded against all odds at poorly resourced schools. How does the matric exam prepare learners for life? We really have to think about this seriously, because we are taking years of a young person's life, when their brains are at their most dynamic and adaptive, capable of abstract and complex thinking, and we are using it to coach them (not educate them) for an exam that doesn't seem to offer much.

While we spend huge amounts of anxiety worrying about the marks our learners achieve in standardised tests, these marks turn out to be very poor indicators of a young person's ability to create an economically prosperous and personally satisfying life.

Some of the leading education systems and institutions around the world are starting to experiment with alternative strategies:

- focusing less on content and more on the transferable skills that are required to deal with any content;

- privileging project-based learning that helps learners discover and build knowledge from the bottom up, rather than just being instructed by an 'expert';

- blurring the boundaries between subjects and experimenting with integrated studies in which learners can discover the deep structures that different knowledge systems share in common, encouraging systemic thinking;

- accessing the teaching strategies of a wide range of experts (more diverse than any one school could employ) via online education;

- bringing democracy into the classroom and school culture, giving learners more say in what they learn, how they learn and how they are assessed.

University campuses are facing similar challenges to those faced by schools. They are being criticised for not adapting fast enough; failing to create culturally relevant pedagogies; offering too few inter-disciplinary opportunities; creating inflexible subject choices within degrees; and not taking advantage of the new collaborative opportunities that digital technologies provide.

Going to university definitely increases a young person's chances of creating an economically prosperous and personally satisfying life, but the grades that are used to determine their access to this opportunity are a persistent delusion. Perfect grades don't always matter, and do not necessarily correlate with long-term success. Pressure to get good grades also take a toll on wellbeing, encourage cheating, and discourage risk and creativity.

How do we go beyond our focus on prescribed content towards a focus on transferable skills that can help learners to engage any content?

How an understanding of transferable skills can strengthen a community of practice

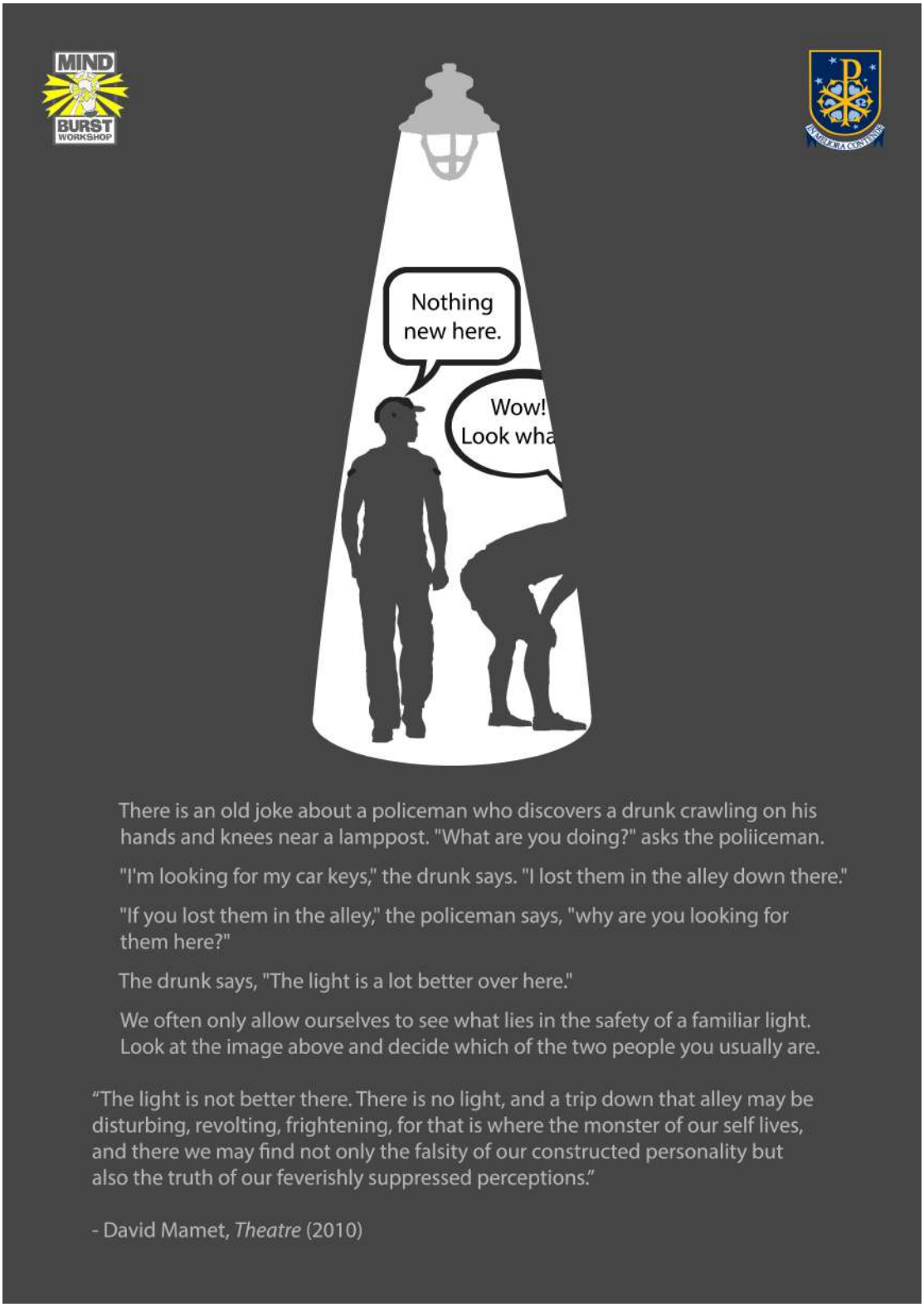
It helps if the school community shares a common language that makes explicit, engages, recognises, and reinforces transferable skills. You could think of this as an on-going whole-school conversation about what is needed to produce knowledge and thrive in the 21st century. You may decide to facilitate a whole-school conversation by doing the following:

- focusing on a particular skill in a particular grade (or the whole school) for a certain period of time (possibly three weeks) before moving onto a new one;
- spending 5 minutes discussing that skill in a staff meeting;
- giving teachers a one-page that is part factsheet (that describes the skill and unpacks it a bit) and part teaser (that stimulates and challenges them);
- inviting teachers to find opportunities in the allocated period to integrate opportunities for exploring the skill into their existing lessons and teaching practice (in an explicit rather than implicit way);
- encouraging teachers to share their lesson plans, insights and resulting experiences with colleagues so that the conversation on transferable skills continues to be enriched;
- keeping the conversation going with teachers, learners, other staff, and parents.

In this way the school community slowly develops a shared understanding of a specific skill. Learners also get to experience the same skills in different subjects. This deepens their understanding and equips them to engage the world more effectively. It also strengthens their ability to transfer skills from one context to another.

Teachers should not experience the focus on a skill or skills set as a top-down imposition but a collaborative process. This is primarily a learning journey that teachers need to make together, not the memorisation of a predesigned template

(as useful as that may be). For a whole-school conversation to succeed, it needs a champion who will drive it and keep it on track. That champion may decide to create a display in the staff room to further stimulate the imagination of teachers, or put posters up around the school to explore the skill that has been chosen for that cycle of the conversation.



Assessment – based on an understanding of a skills scaffold

The rigour of MindBurst's project-based learning (and integrated studies) lies in identifying the transferable skills we want learners to practice, making them explicit objectives for learners and teachers, integrating opportunities to explore them (in the form of carefully designed activities), while regularly encouraging learners to reflect on the process, giving and receiving feedback.

Before transferable skills can be assessed they need to be clearly articulated. A teacher needs to know what they will see in the classroom as evidence of acquiring, practicing and mastering that skill. They also need to know, "What other skills is this skill contingent on?" In other words, "Are there components of sensory, physical, emotional or cognitive skills that need to be in place before that skill can be acquired?" This is because all skills have a fairly predictable acquisition sequence (a kind of developmental scaffold). If a school community is clear about the transferable skills they expect learners to have achieved by the end of Grade 12, they can ask themselves what those skills could look like (or what components are necessary) in Grade 11, 10, 9, and so on, all the way down to Grade R. In this way teachers can visualise the journey learners are making and can collaborate more effectively across grades. (There is an example of this in the APPENDIX.)

Once you have an understanding of how skills build onto each other, you can also assess learners more effectively, because you can identify where their proficiency at a particular skill is with regards to the acquisition sequence. This is more than assessing whether they are at the level of proficiency for their grade. It is about assessing what their level of proficiency is with regards to their own developmental possibilities. In other words, you can be clear about their growing edge (zone of proximal development). This is more effective than just measuring them against expectations for their grade or age. You can make sure that the component skills they need are in place before they attempt to acquire a skill. You can focus on what the next step in their personal learning path is so that they have a positive experience of personal achievement and mastery, rather than simply being ranked against their peers. This makes assessment something that adds value for the learner. Bear in mind that some learners may be behind their peers in certain skills sets and ahead of them in others.

You may decide to create a rubric to assist you. We have used rubrics to inform the written feedback we give learners. We prefer written feedback to marks, because marks don't say enough, and they tend to be focused on ranking learners against other learners in a undefined and abstract way, instead of placing a learner on a path of personal growth – comparing their performance to their own potential. The table below is an example of a rubric that we used for an Integrated Studies project with Grade 8 and 9 learners. The statements describe what we expect to see, but they are also designed to give the learners themselves accurate feedback. Once we have agreed on which statement is appropriate for a learner, we then often adapt it to that specific learner, adding or removing an adjective, or expanding a little on a specific insight. It is a template to work with but should be adaptable.

Rubric for Grade 8 & 9 Integrated Studies

Participation in team work Exceeds expectations	**Participation in team work** Meets expectations	**Participation in team work** Approaching expectations	**Participation in team work** Not yet approaching expectations
Takes initiative to keep the team on task and manage distractions. Shows awareness of the needs and progress of individual teammates, helping them to solve problems towards completing the task together.	Always makes an effort to contribute to completing the task together. Encourages teammates and gives meaningful feedback. Usually avoids distractions.	Sometimes makes an effort to contribute to completing the task together. Is capable of making more effort to engage teammates with meaningful feedback. Finds it difficult to avoid distractions.	Never makes an effort to contribute to completing the task together. Does not engage teammates meaningfully. Always disengaged or distracted.
Participation in dialogue Exceeds expectations	**Participation in dialogue** Meets expectations	**Participation in dialogue** Approaching expectations	**Participation in dialogue** Not yet approaching expectations
Deliberately engages the process of dialogue, helping the team manage the process so that everyone has an opportunity to contribute. Highly motivated to learn together with others.	Always participates actively and enthusiastically in dialogue, sharing ideas and listening to others with respect and interest. Very willing to learn together with others.	Has demonstrated the ability to participate in dialogue and could improve through more sharing and listening with respect and interest. Sometimes willing to learn together with others.	Needs to work much harder on understanding what is standing in the way of participating fully in dialogue with others. Shows no willingness to learn together with others.

Creative thinking Exceeds expectations	**Creative thinking** Meets expectations	**Creative thinking** Approaching expectations	**Creative thinking** Not yet approaching expectations
Highly motivated to use their imagination and experiment with combining ideas, texts, media, materials and personal experiences in surprising ways to solve a problem or make something new.	Willing to use their imagination and to risk experimenting with combining ideas, texts, media, materials and personal experiences to solve a problem or make something new.	Hesitant to use their imagination and to experiment with combining ideas, texts, media, materials and personal experiences to solve a problem or make something new.	Not willing to use their imagination and to experiment with combining ideas, texts, media, materials and personal experiences to solve a problem or make something new.
Thinking independently Exceeds expectations	**Thinking independently** Meets expectations	**Thinking independently** Approaching expectations	**Thinking independently** Not yet approaching expectations
Actively seeks out new knowledge and insights. Always asks probing and challenging questions. Expresses things in their own words. Works things out for themselves and can effectively monitor their own learning process.	Motivated to understand things, often asks clarifying questions and tries to express things in their own words. Tries to work things out for themselves and shows the ability to monitor their own learning process. Willing to question cultural assumptions.	Sometimes motivated to understand things, asks questions from time to time and does on occasion try to express things in their own words. Still outsources most of their thinking to the group, practiced routines and cultural assumptions. Needs more practice at working things out for themselves and becoming more aware of their own learning process.	Unmotivated to think for themselves and unable to monitor their learning process. Cannot think beyond the views of the group, practiced routines and cultural assumptions.

Projecting into the future Exceeds expectations	**Projecting into the future** Meets expectations	**Projecting into the future** Approaching expectations	**Projecting into the future** Not yet approaching expectations
Makes exceptional use the ideas explored in the session to imagine possible futures and makes an effort to grapple with the personal choices that could determine their experience of those futures.	Able to use the ideas explored in the session to imagine possible futures and explore the personal choices that could determine their experience of those futures.	Trying but struggling to use the ideas explored in the session to imagine possible futures and find relevant connections to personal choices. Need more practice projecting into more distant time-horizons.	Not able or willing to project into the futures. As a result did not engage the ideas the sessions explored. Needs assistance with thinking about their own long-term future.

We sometimes like to give the same rubric to learners so they can assess themselves. Teachers can then compare the learner's perception of their own performance with their assessment.

Learners need to be able to reflect on what they have learnt at regular intervals and make the connections between different gains, looking back over a series of learning experiences and recognising a sustained process of "growing" or "building" knowledge together. They need to be able to tell the story of their own learning journey and imagine how they would like that story to develop into the future. One of the challenges facing us is to reframe failure so that learners do not fear it, but gain valuable insights through it. One way of doing this is to reveal a learning path and help learners to see where they are on that path and where they can choose to go next. When there is no fear of failure learners will linger longer in the learning experience getting more out of it – long enough to reflect deeply, create multiple 'rough drafts' that integrate critical feedback, practice a skill because they are motivated to develop mastery, and experience the satisfaction of exploring, discovering, developing and expressing their own potential.

Assessing transferable skills rather than content requires a different kind of attention from the teacher. By focusing on transferable skills rather than content, the range of skills that learners can explore and master opens up, because we move beyond rote memory and the step-by-step procedures that we usually assess, to include a more diverse sets of skills that are necessary for thriving in the 21st century.

When we base the design of learning experiences on what we can assess there is a narrowing of perspective into categories that often fail to hold the complexity and

richness of the experience. Creating opportunities for exploring, experimenting with, practicing and mastering transferable skills is not just about assessment. We need to recognise that not all learning can be accurately assessed and that doesn't mean it should be neglected.

In the APPENDIX on page 13 we have unpacked the transferable skill of asking questions as an example of the kind of conversations your community of practice could produce.

Grade 10 learners from Sacred Heart College explore the knowledge and intuitions they have about their own thinking habits by creating a control panel of the mind. They used images of dials, buttons, screens and other bits of technology to collage a control panel. We then asked how they would manipulate the mental 'controls' they had imagined, as they obviously could not use their hands. We facilitated learners to reach the conclusion that they could only do this by asking questions. They then had to identify the questions that would work best for different controls. In this way we introduced metacognitive thinking.

Some useful questions to ask yourself when planning effective learning experiences that facilitate the development of transferable skills

What transferable skills am I going to focus on in this lesson?

> You shouldn't focus on more than three skills at a time. This will help you unpack each one thoroughly. Even one skill is sufficient.

How does my school's culture and my own teaching practice currently value and engage this skill?

> This will help you to think about whether you need to signal that you are doing something different, so that learner expectations can be informed.

How do I define this skill?

What does the literature in the field of education say about this skill?

What other sensorial, physical, emotional and mental components (or more fundamental skills) is this skill contingent on?

> To help learners get the most out of a learning experience or curriculum content, we use Robert Marzano's framework for thinking skills to reflect on a lesson plan:
> - What types of information do learners need access to before they can engage this learning experience fully?
> - What mental procedures are necessary before a learner can engage this learning experience fully?
> - What physical procedures are necessary before a learner can engage the learning experience fully?
> - What thinking skills will help a learner get the most out of the learning experience – going beyond the "what" to think towards the "how" to think?
> - What kinds of metacognitive questions can learners ask to reflect on and monitor and manage their thinking in this learning experience?
> - What opportunities will learners be given to express their feelings and thoughts about what they are learning, as well as their beliefs about their ability in that learning experience?

How will I recognise when learners are engaging, practicing and mastering this skill in class? What will I see them doing and saying?

What words and phrases can I use to describe different stages of acquiring this skill (a skills scaffold) so I can help learners to understand where they are on their learning path?

What are the activities I can create to enable learners to explore, discover, develop and express this skill?

Activities should enable learners to explore and discover skills in a way that is meaningful to them, with as little top-down instruction as possible.

How can I encourage learners to linger in the process of the learning experience process rather than rush to complete a predictable outcome?

It helps to structure activities in a way that doesn't allow the learner to see a solution immediately, but encourages them to persevere, explore, collaborate and experiment with different approaches and ideas. You can even add a "curve ball" that forces them to adapt to a new variable.

How can I involve learners, right at the beginning of the process, to come to an agreement on the criteria for assessment?

This simple addition to your process will improve everyone's understanding of what you are all trying to achieve. This is especially important when learners are being asked to be creative and innovate – then the creative constraints and the criteria for success (as contrived as they may be) need to be clear.

How will I assess the skill during the lesson/project?

Where possible, the bulk of your assessment should be on the learner's performance during the process not the final outcome.

What are the feedback opportunities during the process that will help learners to reflect on and refine their skills?

How will learners assess themselves and each other?

Learners often experience anxiety about being assessed by their peers. How can you encourage learners to participate in productive dialogue where criticism and disagreement are mutually beneficial?

How will I assess the skill at the end of the lesson/project?

While memorisation is important for certain tasks, you might want to experiment by not giving any marks for memorisation. This will force you and your learners to focus on other skills.

What work experiences and satisfying life experiences do this skill relate to? How can I explore these with the learners in order to provide a relevant social, cultural and economic context?

By the time learners complete Grade 12 they should be able to …

What follows is a list of skills MindBurst has identified as necessary for learners to master by the end of Grade 12. You may want to collaborate with your community of practice to create your own list. It is worth spending time thinking about the language and detail you use to describe each skill – and then edit it as your understanding grows. Being able to specify a skill or skills set as accurately as possible is necessary if you are going to design activities that enable learners to explore those skills; and if you are going to create assessments that give learners accurate feedback about their learning path. This list is a work in progress. We suggest that you create, interrogate, debate and constantly edit your own. Your feedback on our list would be valued.

By the time learners complete Grade 12 they should be able to:

- experience intellectual self-sufficiency and autonomy, making them agents of their own knowledge production (not just knowledge consumption and reproduction), able to extract meaning from, and impose structure on, information, building their own models of reality more deliberately;

- cope with the cognitive demands of tertiary education and work (to think for themselves and feel confident in their own abilities to solve unfamiliar problems, rather than what they have rehearsed and memorised) and become life-long learners;

- develop an increased sense of self awareness – especially a curiosity about the source of their own thinking habits, recognising that most habits are inherited through biology and culture, and some through intense personal experiences;

- experience the kind of self worth and confidence that reduces a reliance on the acceptance of others, but is sensitive to the way the performance of self is perceived by others;

- become more mindful of the world around them and the consequences of their actions – showing a genuine interest in where things they consume come from and where waste they produce goes to;

- choose and articulate goals with a sense of self-determination rather than fulfilling the expectations of others – and adapt those goals when the available information and opportunities change;

- communicate and negotiate effectively, making the connection between “what I want” and “what they want”;

- collaborate dynamically (not just cooperate reluctantly);

- network within a like-minded “community of practice” that shares a common “discourse,” without becoming trapped in epistemic bubbles and echo chambers;

- resist peer pressure and reflect honestly on what satisfies them most;

- allow dissent and engage fully with disagreements and other points of view (giving then time, energy and attention);

- embrace an experimental attitude (where creativity and criticism come together in their most dynamic way) and design personal lifestyle experiments deliberately by:
    - being clear about what they want out of the experience;
    - getting as much information as possible, from diverse sources, in order to make an informed choice;
    - how this choice could limit their choices in the future;
    - deciding what risks are worthwhile and avoiding unnecessarily high-risk experiments (what is the worst thing is that could happen?);
    - reducing the potential harm as much as possible;
    - getting the most out of the experience;
    - letting people who care about them know what they are intending;
    - knowing where to get help if something goes wrong.

- design models of reality (based on the available evidence and capable of making accurate predictions) that offer simpler, but nevertheless accurate, representations of complex processes – and then test those models’ ability to make predictions;

- understand learning as a self-correcting cycle that moves from critical observation (experience), to questioning, to a creative attempt at an answer, to testing that answer through experiment, to evaluating the results of the experiment, to revising the answer or asking new questions;

- constantly adapt performance on the basis of feedback;

- interrupt impulsive responses and step back from a challenge in order to see the bigger picture, delaying gratification in the short-term (making sacrifices) in order to ensure greater satisfaction in the long-term;

- acknowledge and articulate emotional, instinctual and intuitive (emerging thought patterns) responses without being determined by them but nevertheless considering them as valuable feedback mechanisms;

- persevere and build resilience by not giving up too quickly just because the solution does not appear immediately, and by bouncing back from failure (not fearing failure but seeing it as a learning opportunity);

- manage loss constructively by embracing grief as a natural process that needs time to work itself out (in its most sophisticated form this is the skill of letting go or “detachment”);

- take the long-view of things, projecting into the future and daring to imagine your own future;

- avoid jumping to conclusions before considering all the available evidence – and to avoid making generalisations (and turning them into fixed categories) and assumptions (and turning them into stereotypes) that can potentially cause harm;

- base interpretations of phenomena on the analysis of diverse sources of information and observations of that phenomena, comparing the differences and similarities in those sources;

- resist the urge to collapse complexity into simplistic generalisations, like:
    - simple moral binaries (‘black and white’ opposites);
    - fixed categories;
    - singular identities;
    - neat, linear relationships of cause and effect; and
    - absolute truth;

- actively engage the process of encoding and decoding cultural symbols and the influence they exert on people’s thoughts and actions;

- use deductive reasoning and the evaluation of evidence to analyse claims, propositions, explanations and arguments – to expose faulty reasoning and deception, and to resist manipulation;

- have a practical understanding of how statistics are used to communicate information (and misinformation);

- maintain a healthy scepticism that is able to ask probing and generative questions about anything, especially generalisations, assumptions, values, tradition, authority and power;

- create analogies, recognising similar principles and deep structures in different knowledge systems – making it possible to transfer skills and knowledge from a familiar context to an unfamiliar context;

- approach challenges playfully with a sense of humour, loosening-up the predictable habits and opening up possibilities for innovative associations;

- be willing to admit to the possibility of being wrong and being committed to identifying error in personal claims, explanations and arguments (because knowing what is going on is more important than being right);

- become more vulnerable to the subjective emotional experiences of others, showing genuine concern and a willingness to engage through actions that are helpful and meaningful to the other person;

- use the available information in combination with a clear sense of vision to create strategies and make decisions, with a critical and compassionate understanding of the consequences of those decisions, willing to be accountable for those consequences;

- appreciate different ways of knowing and being, creating space for diversity, with a genuine desire to understand different points of view and life choices;

- adapt to change with as little anxiety as possible; and

- become an active part of a creative and critical global conversation on the nature of reality that has lasted for centuries.

APPENDIX

Let's explore one example of a transferable skill on more depth – the skill of asking questions

> "I would rather have questions that can't be answered than answers that can't be questioned."
> - Richard Feynman (physicist)

What follows is a collection of ideas that have emerged out of on-going conversations we have had with teachers and our MindBurst team (our community of practice). Research and personal teaching experiences have been shared – and questioned! There can never be a final or authoritative list as our knowledge is always growing.

Identifying the transferable skills a lesson or a project is going to focus on can sometimes be a challenge when we have been used to focusing on content. Making an effort to express these skills clearly will help us to plan effectively. Let's briefly explore one example: *The skill of asking questions*. It seems straightforward enough, but it has taken us a while to really grapple with what we mean, when we say that we want our learners to be able to ask useful questions.

How does your school's culture and your own teaching practice currently value and engage this skill?

> How does your school go beyond privileging questions for which it already has the correct answers?
>
> > We want to go beyond simple comprehension test questions, to give learners opportunities to reflect on:
> > - what they feel,
> > - what caused them to feel that;
> > - how can they use that feeling to learn something about themselves;
> > - what they think,
> > - what they think they know,
> > - how they came to believe what they think they know,
> > - what kind of information they think would change their minds,
> > - what interesting questions they have about how they feel and think.
>
> How are learners encouraged to ask questions?
>
> Do teachers model metacognitive thinking (that is able to reflect on and manage thought processes) for learners?

Are learners encouraged to ask open-ended questions that no one has answered yet?

How do you connect learners to the big unanswered questions in your subject and field?

What famous ground breaking questions asked in the past, added significance to your subject and field?

How do you respond to the spontaneous and self-motivated questions learners ask?

How do you respond to learners who ask questions that you did not plan to cover in a lesson or are not part of the curriculum, without discouraging the habit of asking questions?

Are there questions your school community considers taboo and will reprimand learners if they ask them?

Do you deliberately and explicitly teach your learners how to ask useful, probing, generative, and even disruptive questions?

Are there specific questions you would get your students to rehearse when it comes to:

- participating in productive dialogue,
- developing emotional literacy,
- engaging a set of texts critically,
- analysing an explanation or argument,
- practising media literacy,
- identifying the value of a specific product,
- evaluating the results of an experiment,
- assessing each other's work, and
- diversity literacy (reading power relations)?

These are all good questions for a teaser to stimulate a whole school conversation.

In addition to interrogating the value that is placed on the skill of asking questions in your school's culture, you need to be able to define the skill clearly, and identify the role that it plays in learning experiences.

What characterises a useful question? (See our suggestion below.)

What is the difference between open-ended and closed-ended questions?

What is the difference between questions that can be answered through a specific method (deductive reasoning, research, experiment, dialogue) and questions that require a creative choice (in other words, you have to make it up or accept an answer someone else has made up)?

What does the literature in the field of education say about this skill?

Dan Rothstein and Luz Santana argue in their book, *Make Just One Change: Teach Students to Ask Their Own Questions* (2011), that the ability to ask questions is the most important thinking skill there is. All other thinking skills build onto this key skill. The consequences of knowing how to ask useful questions are completely disproportionate to how easy it is to teach. It is the first step away from simply memorising content. Giving learners the permission to ask their own questions, and helping them discover what constitutes a powerful question, is half the work of critical thinking – and is what distinguishes independent thinkers.

> "In a traditional classroom, the teacher is the center of attention, the owner of knowledge and information. Teachers often ask questions of their students to gauge comprehension, but it's a passive model that relies on students to absorb information they need to reproduce on tests. What would happen if the roles were flipped and students asked the questions?"
> - Dan Rothstein and Luz Santana

The cognitive scientist, Howard Gardner, says:

> "This idea may sound simple, but it is both complex and radical: complex, in that formulating good, generative questions, and being prepared to work toward satisfactory answers, is hardly a simple undertaking; and radical, in the sense that an apparently easy move can bring about a Copernican revolution in the atmosphere of the classroom and the dynamics of learning."

The ability to ask *metacognitive questions* in particular enables learners to think about their thinking, listen to their own thoughts (inner voice) and reflect on them as they happen, to get a better understanding of what is motivating them – their values, reasons and triggers. Metacognitive questions can help learners to:

- monitor and manage their thought processes;
- step back from a situation;
- become aware of emotions, acknowledge them, name them and follow them to their source, without becoming them;
- resist impulse and delay gratification (for greater future gratification);
- get more information before choosing or making a decision;
- see the bigger social and environmental context they are in;
- recognise the complex connections and relationships between variables (people, products, processes and propositions);
- consider the consequences over time;
- clarify what they really want;
- consciously and deliberately plan a problem-solving strategy, define what constitutes success, manage resources, and monitor their progress; and

- ensure the enthusiastic and informed consent of all involved.

Learning how to ask the metacognitive questions that achieve this is empowering. More than anything it is the questions you ask that determine the amount of control you have over your life. Here are just a few examples:

> What am I actually trying to achieve here?
>
> What generalisations and assumptions am I making that could be limiting my thinking?
>
> What does the feedback I just got from her tell me?
>
> What do I still need to know before I make this decision?
>
> What will the consequences of my action be? Who will benefit? Who will suffer?

Learners learn how to ask questions by listening to how questions are asked. This means it is the parent and teacher's responsibility to deliberately model metacognitive questions. "When I was planning this lesson I couldn't decide whether you should work in small teams or alone. So I asked myself: What is the aim of this lesson? Is it to … or is it to … So I decided to … Let's see how that turns out."

When the learner can ask questions meaningful to them in relation to the learning experience they are more likely to own that experience and risk asserting their agency.

Scaffolding the skill of asking questions

Let's explore our example of a transferable skill further by recognising the scaffold (acquisition sequence) necessary for the skill of asking questions. As we do this, consider the idea that the ability to ask questions is not just about increasing understanding but also about increasing agency.

MindBurst likes to teach the idea that being conscious is the ability to stop what you are doing and ask the question, "What is going on here?" Young learners in Foundation Phase are already naturally curious, willing to poke things, mix things, stretch things, shake things or drop things to see what happens. This is their body asking questions about the world, so that they can learn to make predictions about it. This is something that teaching the art of asking questions can take advantage of. Young learners need to start making the shift from manipulating the physical world to imagining they are manipulating the physical world. "What will happen if I …?" This is the beginning of the journey towards abstract thinking. From a very young age learners can already be stimulated to engage their curiosity about the way the world works by being asked questions like, "What's going on here?" (the skill of inference)

and “What is going to happen next?” (the skill of prediction). It takes some time before they can initiate asking these questions themselves. What is crucial is however is modelling questions for learners and slowly giving them more opportunities to ask questions themselves.

When they are very young they battle to answer or ask questions about another person’s subjective experience or intent. We want them to develop curiosity about this. Perhaps it begins by recognising that other people’s favourite food or toys or animals or movies are different from mine. They may not be able to answer the question. “What is your favourite food?” but they can answer the question, “What is your favourite food? Pizza, hamburgers or fired chicken?” It is necessary to give young learners options rather than expect them to generate them. From a young age the experience of choice helps to reinforce a learner’s agency. The experience of being free to choose prepares them for the experience of being free to question.

From about the age of 5 or 6 they can already learn to name some of the feelings they are experiencing and recognise basic emotions from the facial expressions and tone of voice of others, but they are unable to appreciate what exactly in that person’s subjective experience gave rise to that emotion. They can only appreciate very concrete causes like “I hit her … and that made her angry” or “I took her doll … and that made her sad.”

The brains of young children are actively creating categories to organise their experience into generalisations that will save their bodies energy, effort and time. Teachers enable this by exposing them to culturally constructed categories. Our questions like, “Are you sad?” teach a child that sad is an expected emotion and what sad is expected to look like in our society.

> [We need to take care what categories our questions reinforce. The rules, conventions, categories and concepts we teach, like all generalisations, are always both enabling and a limitation. The emotional state we name, for example, when we say, “Are you sad?” is a category we have been taught to think in, rather than a discrete, coherent and consistent state. Emotional experience is more complex, diverse and changing. It is always better to add context and ask, “Are you sad because she didn’t want to let you play with her?” This question asks for confirmation of an explanation not the reinforcement of an abstract category. While the rules, conventions, categories and concepts are useful, from about the age of 13 we need to be creating experiences that help learners to challenge and deconstruct those rules, conventions, categories and concepts – because we want them to be able to question them and decide for themselves if they are legitimate.]

From about the age of 7 learners are more able to suggest their own questions without being given options to choose from. Then a teacher can inspire engagement in a topic by asking learners to ask some questions about it before beginning. “Today we are going to explore deserts. Can you think of some of the things we might be interested in if we are talking about deserts? … What do you know about deserts?

Who can give me some facts about deserts? … What would you like to know about deserts by the end of this project?" This gives learners some ownership over the learning process and reinforces their agency. It can also help a teacher identify existing knowledge and ignorance.

From around 8 or 9 they can begin to reflect on the subjective experience and the intent of others. This means that they can start deepening their emotional literacy to experience empathy and to participate more actively in practices like restorative justice. Learners are starting to develop skills to manage personal conflict – and should be given opportunities to talk about those skills. The restorative justice approach uses questions to engage participants in understanding the conflict they have been part of. Instead of blaming and punishing, the process seeks to deepen mutual understanding through asking non-judgemental questions: "What happened?" "What were you feeling?" "How did what you did make him feel?" "How can you make things better right now?" "What will you do differently next time?" Learners at this age should also be asked questions that get them to "observe and describe".

From the age of 9 learners can answer more open-ended questions and compare their answers with others. They should start developing a theory of mind (an understanding that other people have subjective experiences different from theirs). They are starting to become less egocentric, and think about what it is like to be someone else (still in very concrete terms), so they can also start thinking about differences and similarities between people without judgement. By enhancing a clearer sense of self-worth, learners can be more open to recognising and appreciating differences in others. Examples of questions to explore are different family structures and different personal tastes. Respect is key to listening at this age, and an important component of asking questions. Respect can take the form of sharing, taking turns, helping, praising, being safe, being neat, tidying up after yourself – and listening with respect. With regards to emotional literacy learners should begin asking metacognitive questions that help them to resist impulse, reflect on the consequences of their actions, and act in ways that are helpful.

From about the age of 10 or 11 they should also be able to go beyond applying the routine of asking "What's going on here?" to asking "What questions can I ask to help me work out what's going on here?" They are able to start asking metacognitive questions to monitor and manage their own thinking. When it comes to metacognitive questions around emotional states, they can go beyond articulating what they are feeling to asking "Why am I feeling what I am feeling?" "What triggered that?" They need to ask questions that begin to interrogate the way they are impacted on by the world and the way they impact the world. They should also be able to ask more sophisticated questions about the subjective experience of other people. "What does he want?" "How does he plan to get it?" "What questions can I ask to help me know more about what he wants?" They are also able to ask questions related to emotional literacy that help them to proactively engage what other people are feeling. "What are they feeling?" "How can I help?" "How can I make a difference?" This means they can engage restorative justice with a more

deliberate attempt to understand someone else's experience. Learners can also start asking about their own process of learning (and knowledge production): "What do I know about this?" "Where did I learn that?" "What more do I want to know?" "How can I find out more?"

By the age of 12 they should already understand the role of questions in the typical learning cycle. They can explore some of the greatest questions that have been asked in in the process of creating our knowledge of the world and grasp the basic structure of scientific method, and the role of questions in the way scientists think. They are beginning to think more deeply about how they know what they know. They are able to look outside themselves and recognise how all cultures have been curious and asked, "Where did all this come from?" "Why are we here?" "What happens after I die?" They can begin to appreciate how answers to these questions are expressed differently in different cultures. Also, rather than just answer the questions that explore restorative justice, learners should be able to articulate them and initiate them, especially since they are taking on leadership roles in their primary school. This is the age at which they can ask questions about where rules come from and can start developing their own social contracts. They should be able to start asking each other questions about how they arrived at their opinions and beliefs – as well arguing for their own opinions.

By 13 learners are able to begin questioning and understanding more abstract issues like spirituality and truth. They can ask more complex questions about morality and ethics, and see that things are not always easily categorised as 'good' or 'bad'. They should be allowed to begin questioning the rules, conventions, categories and concepts their society has taught them, moving beyond hard-edged categories, simple binaries and singular identities. This is a vital skill for managing their self-esteem, among other things. They need to understand the difference between doubting an idea you have had and doubting your ability to have ideas.

By 14 they should be using the skills they have developed to analyse media, messages and the techniques that people use to try and persuade them. They can begin to explore the difference between open-ended and closed-ended questions, turning open-ended questions into closed-ended questions, and vice versa, reflecting on the results. They can experience the power of closed-ended questions through decision trees, flow-charts and basic computer programmes. Grade 9s can also definitely benefit from the idea of asking questions when they are on a date, to show interest, avoid dominating the bandwidth and to generally avoid saying embarrassing things.

By 14 or 15 learners can think more deeply about the burning questions they carry around in themselves as part of their personal 'vision quest'. They can begin to see how unresolved questions determine much of how they feel, think and act.

By 15 they should be regularly questioning their assumptions of their predictive brains, understanding some of the limits of perception, emotion, memory and representation. They should also be designing effective experiments to test their

predictions. They should be analysing their own burning questions. “Is the question I am asking something that can be answered with a bit of logic, research and strategic thinking? Or is it something that there is no clear method for answering and I will have to make up something that may not be true but is meaningful to me?” They should be challenged to identify the most useful questions anyone can ask in any situation (recognising useful principles). “What is the most useful question I can ask in this situation?” “How can I enjoy satisfaction now without compromising the possibilities of my satisfaction in the future?” “Who will benefit from this? Who will suffer because of this?” They can engage the powers of persuasion and manipulation even further, like how leading questions, closed-ended questions and the excluded middle are used by sales people and lawyers to trap people. “Will you be paying by cash or by card?” “Did you deliberately hurt the child or was it the unintentional consequence of your neglect?” This is also an age where learner should definitely be able to ask, “What questions have I been told I shouldn’t ask? Why should I ask them?”

By the age of 16 and 17 we expect learners to maintain a healthy scepticism that is able to ask probing and generative questions about anything, especially values, tradition and the legitimacy of power. They should also be able to ask questions that recognise the dangers of generalisations, categories, assumptions, superstitions, stereotypes, and prejudices that do not add to our understanding of the world around us.

Having said this we need to appreciate that different learners have had different experiences that have enabled or been a barrier to learning. The use of age groups here is a heuristic, but not any indication of cut-off points for success or failure. While we do want to know whether a learner is approaching expectations appropriate for their grade or if they have exceeded them, we are more interested in identifying where they are on their own learning path, what support they need to overcome barriers to learning, and what opportunities or stimulus they need to move towards their growing edges.

Children who live in highly stimulating environments, where there are a variety of options available for play, where they are spoken to a lot, learning lots of words in the process, and where they are allowed to speak and express themselves, tend to be capable of asking questions sooner than other children. This is because, like all skills, the skill of asking questions is not independent of other skills. It exists within a dynamic network or scaffold of skills, dependent on some and a fundamental building block for others.

To really understand this we need to ask: What other physical, emotional and mental components or more fundamental skills is the skill of asking questions contingent on? How dependent is asking questions on hearing questions, or on reading questions? Perhaps the skill of asking questions requires learners to communicate clearly and audibly, using the right vocal tone to signal a question? (Perhaps that in turn requires a parent or a teacher who can model how to ask questions?) Perhaps it requires a rich grammar that allows learners to be very specific? Perhaps it requires

leaners to have some idea of what they want, so that they can go beyond choosing from options and imagine what would satisfy them? Perhaps it requires leaners to be confident, assertive and relatively unafraid of failure. (Perhaps that in turn it requires a home and school culture where there is very little bullying, racism, sexism, and homophobia?) Perhaps it requires a classroom culture where leaners listen respectfully to each other, creating space and time for the formation and refinement of questions (especially when learners are not communicating clearly and confidently)? Perhaps it requires learners to be genuinely curious about the world and about the subjective experience of others?

What makes a question useful?

- It stimulates our curiosity;
- its ability to help you step out of the immediate experience and think about something outside of its physical, emotional and cultural context;
- it goes to the heart of the challenge helping us to define it even more clearly and therefore develop a deeper understanding;
- it is clearly stated and unambiguous (it doesn't have any words that are too open to interpretation and still need to be defined);
- it doesn't ramble on unnecessarily (unless it is still trying to find itself, which should then be signalled by the speaker);
- it is possible to come up with a method for answering it (this doesn't mean the answer already exists, but that we can imagine a possible method for answering it, rather than it being forever impossible to answer)
  … if not, we may need to admit that its is an 'intractable question', the answer to which involves a creative choice;
- if it is an 'open-ended question' then it can generate a lot of information and add to our understanding, rather than a 'closed-ended question' that only gets us a simple "yes" or "no" answer that doesn't add much more to our understanding;
- a closed-ended question is better for managing step-by-step procedures or manipulating people towards a predetermined outcome (on the basis of either/or choices), like a sales pitch, a diagnostic flow chart, a decision tree or a computer programme;
- it is not a simple and trivial 'comprehension test' question, testing whether we have memorised an answer which we have already been exposed to in some text or presentation – but a cognitively complex question that demands deeper understanding, effective application, critical and creative grappling;
- it is not a 'leading question' that already contains the answer in it or limits the answer to two options (the excluded middle);
- it is a question that is unusual and is rarely asked;
- questions deeply held assumptions, exposes and breaks through biases, and challenges power dynamics (and for this reason is disruptive, perturbing and makes people feel uncomfortable);
- it leads to further useful questions.