

MOM, TUT, SENSE MAKING and RICH LEARNING TASKS

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In this paper the author examines a classic police procedure (used to identify crime suspects), generalizes it, and contemplates the implications of this general procedure (identified by the acronym MOM) for teaching and learning. For the author, one pedagogical implication of MOM seems clear, rich learning tasks are an essential ingredient for student sense making.

Who Killed King Tut?

There is a fascinating article, entitled *Mummy of All Mysteries*, in the February 1-2, 2003 edition of the Weekend Australian Magazine. It describes how two police officers solved one of history's greatest 'whodunits', the murder of the Egyptian pharaoh Tut. The murder had taken place 3500 years ago. The trail was ccccold. The modern sleuthing techniques they used included a clever application of MOM. With MOM they were able to sift through those surrounding Tut, identify four prime suspects [army commander Horemheb; prime minister Ay; treasurer Maya; wife / sister Ankhesenamun] and, finally, gather enough evidence to identify the murderer, Ay, the pharaoh's prime minister.

MOM It was their use of the technique MOM that caught my attention.

For those unfamiliar with the acronym, MOM stands for *motive, opportunity, and means*.

Motive - what the culprit stands to gain from the crime

Opportunity - access to the victim

Means - a weapon and the ability to use it

For the detective, a person cannot be a suspect without MOM. A person without anything to gain from the crime, without the opportunity to commit the crime, and without the means to carry out the crime, simply won't / can't commit the crime.

The General Principle of MOM

When expressed more generally, it becomes apparent that MOM can be applied to far more than police work.

The General Principle of MOM: A creature will not / cannot commit an act unless it is motivated to do so, unless it has the opportunity to do so, and unless it has the means to do so.

Without MOM the shark does not strike, the fisher (man or woman) does not catch a fish, the bird does not reproduce, the artist does not create a work of art, the student does not learn.

In this paper I focus on the connections between MOM and things pedagogical, specifically, the connections between MOM and:

- . the sense-making student,
- . the teacher animating / enabling / facilitating student sense making,
- . assessment,
- . the role of rich learning tasks, and
- . the learning environment

SENSE MAKING

A major goal of education is to graduate sense makers. [I think Herbert Spencer, the 19th century philosopher and coiner of the phrase, 'survival of the fittest', put it well when he said, '*The great aim of education is not knowledge but action.*'] At the moment, unfortunately, too many seem content to graduate people who are merely knowledgeable. Sense making includes such things as,

- . teaching for understanding
- . learning with understanding
- . making sense of / with concepts and procedures
- . making sense of situations (significance / implications etc.)
- . exercising / indulging one's intuition / imagination / curiosity
- . make sense to / of others
- . learning / using / refining sense-making procedures
- . inquiring / investigating / experimenting

. problem solving / posing

MOM and The Sense Making Student

Applied to the sense-making student, MOM tells us that, *students will not / cannot make sense, or learn with understanding, unless they are motivated to do so, have the opportunity to do so, and are in possession of the means to do so.*

More specifically, a student will not /cannot make sense without the following:

Motivation

- . primal / subconscious predispositions / urges / needs
- . joy, puzzlement, pleasure, wonderment
- . outcome of the act perceived to be something of personal significance / value / relevance / importance
- . task contextually / intrinsically interesting / provocative
- . work in a learning environment that is supportive / encouraging / safe / nurturing
- . expectation of success
- . sense of ownership

Opportunity

- . to inquire / investigate / experiment / problem solve
- . to engage successfully with a rich learning task
- . to work in a supportive / safe / nurturing / encouraging environment
- . to reflect / monitor / revise
- . to know what success looks like / have access to rubrics
- . to access appropriate tools / resource
- . to talk / question / probe / interact

Means

- . possess facility with inquiry / sense-making / problem solving processes
- . possess needed conceptual and procedural knowledge / technical skills / communications skills to engage successfully with the learning task
- . access to rubrics

[At this point it is worth reminding ourselves that a major goal of education is to graduate students who are self-motivating and who are able to create (independently and with others) their own opportunities and means for taking advantage of such opportunities.]

MOM and the ANIMATING / ENABLING / FACILITATING TEACHER

Definitions: *animate* v. to give life to; make alive; stimulate; give spirit to; move to action; encourage
enable v. to make able; give power, means, or ability to; make competent
facilitate v. to make easier or less difficult; help forward (an action, process, etc.)

A major task of the teacher is to animate, enable, and facilitate student sense making.

Applied to the animating / enabling / facilitating teacher, MOM tells us that, *teachers will not / cannot animate / enable / facilitate student sense making unless they are motivated to do so, have the opportunity to do so and are in possession of the means to do so.*

A teacher's animating / enabling / facilitative actions can also be grouped under the three headings of MOM.

Motivation

- . present students with situations that provoke their curiosity / drive their desire to find out
- . help students to understand / appreciate the significance / relevance of the situation confronting them
- . ensure students work in an environment that encourages / supports sense making

Opportunity

- . select / design / structure / contextualize / introduce relevant learning situations
- . place before students situations that result in students engaging in rich learning tasks
- . ensure that students take good advantage of the opportunity afforded them
- . adapt / modify situation / task to meet individual needs

Means

- . model good sense-making practices / habits

- . ensure students possess needed conceptual / procedural knowledge and resources
- . encourage meaningful / effective interaction
- . help students to focus / clarify / reflect upon their thinking and the products of their thinking
- . provide meta-cognitive guidance / rubrics
- . ensure students identify / develop / refine / extend / apply the tools and procedures with which they need to act
- . help students to record / communicate their thoughts and products
- . help students to assess / revise actions and products of their actions

Experienced teachers know that lesson effectiveness is reduced when insufficient attention is placed on one or more of the three dimensions of MOM. MOM is a necessary but not sufficient set of conditions for action. Students with the MOM to 'commit' sense acts, do not necessarily commit them. The task of the animator / enabler / facilitator / teacher is to try to ensure that they do,

The Dynamics of MOM

The examples below demonstrate how the dimensions of MOM can feed on / influence / shape / generate one another [with pedagogically positive or negative consequences.]

Motivation: Highly motivated people often search out targets of opportunity or create opportunities for themselves. Motivation can cause people to search out and find the means to exploit opportunities. Motivation can also feed upon itself [excitement breeding excitement, fear bringing on greater fear, ...] Negative motives [not wanting to be wrong, acting primarily to please the teacher, ...] can limit opportunities and warp tool use. Motivation, rewarded, can produce in the student such things as pleasure, guilt, satisfaction, embarrassment, and habituation. Motivation, unrewarded, can produce such things as aversion, indifference, frustration, anger, and modification of behaviour.

Opportunity: The presence of an opportunity can heighten motivation, lead to the creation/accumulation of the means to exploit the opportunity. Exploitation of an opportunity can lead to the opening of doors to new opportunities. Limited opportunities can diminish motivation and warp / limit tool use.

Means: New / powerful tools can make a person look at things through different eyes, develop new skills and open up new opportunities. Primitive / unsophisticated tools can diminish the ability to exploit opportunities or can motivate students and teachers to create more effective tools and processes.

MOM and Assessment

MOM identifies suspects not culprits. Detectives need evidence that a suspect with the MOM to commit a crime actually committed the crime. They need such things as 'smoking guns', corpses, witnesses, and things that place the suspect at the crime scene. They need evidence / proof that suspect did it (or at least enough evidence to elicit a guilty verdict from a jury.)

Similarly, the teacher needs evidence that all three elements of MOM are well established and that their animating / enabling / facilitating actions have been effective. In addition, the teacher and their students need evidence that sense has been made, that learning has taken place. They need evidence that allows them to judge the quality of the sense making and the quality of the sense made. The teacher and students get this evidence through good assessment practices. Based on this evidence, successful teachers and students act to improve / refine / extend student sense making processes and product.

MOM, Sense Making and the Role of Rich Learning Tasks

Most (classroom and take-home) tasks undertaken by students are not very 'rich'*. They, typically, generate lots of activity. Unfortunately, the activity generated is usually not of the sense-making kind. Most of the activity takes the form of listening, practising individual procedures, drilling, memorizing, mimicking, copying, responding to the questions of others, following the directions of others, and regurgitating (or re-packaging) given truths in a speedy, lockstep, mechanical, predictable, 'safe', un-reflective, uni-directional, un-original, un-imaginative, un-interesting, artificial, superficial, and (often) un-caring way. The typical classroom task does not motivate sense making, does not provide the opportunity for sense making, and does not encourage the (authentic) use of sense-making tools and processes. [Many (including teachers, students, school and board administrators, parents, politicians, teacher educators, testing authorities, resource producers, politicians, business people, media people, and entertainers) contribute to this unhappy state of affairs.]

[*I define any learning task as *rich* if it gives students the opportunity to do three things, namely,

- . use (and learn to use) their knowledge in an integrated, authentic, creative, and purposeful fashion to conduct inquiries, investigations, and experiments (solving problems in the process), and in so doing,
- . acquire knowledge with understanding, and in the process,
- . develop the attitudes and habits of a life-long sense maker.

Put more simply, a learning task is rich if it allows students and teachers to play the sense-making game.] Rich learning tasks successfully designed / adapted / facilitated by the teacher and successfully engaged in by the student provide the student with the MOM to make sense, the MOM to learn with understanding, the MOM to problem solve, the MOM to behave like a practitioner in the discipline, and the MOM to be true to their nature as a sense-making creature. Usually, as engagement in such tasks progresses, additional motivation is generated, opportunities are expanded, and knowledge and skills are introduced, refined, and extended. [For a more complete treatment of rich learning tasks, see Flewelling with Higginson, 2003.]

Conclusion Before students and teachers can engage in sense making, they need the MOM to do so. Unfortunately the kinds of tasks in which students typically engage (and the ways in which the tasks are typically engaged) fail to motivate sense making, fail to provide opportunities for sense making, and fail to encourage the development and use of sense-making tools and processes. This failure to ensure that our students have the MOM to sense make is, in my opinion, a (pedagogical) crime far more sensational and far more significant than the murder of Tut.

Some Follow-up Tasks for the Reader

[The following tasks may help the reader reflect on the contents of this paper.]

Task 1. *“A creature will not / cannot commit an act unless it is motivated to do so, unless it has the opportunity to do so and unless it has the means to do so.”* Conjure up some everyday examples that illustrate this principle.

Task 2. Conjure up some illustrative examples to support the following statement: *“Experienced teachers know that lesson effectiveness is reduced when insufficient attention is placed on one or more of the three dimensions of MOM.”*

Task 3. *“A teacher will not / cannot animate / enable / facilitate student sense making, unless they are motivated to do so, have the opportunity to do so and be in possession of the means to do so.”* In general, are teachers motivated to animate / enable / facilitate sense making? Do they have the opportunity to do so? Do they have the means to do so? Explain.

Task 4. *“Students with the MOM to ‘commit’ sense-making acts do not necessarily commit them.”* Generate some illustrative examples to clarify this statement.

Task 5. Identify some of the factors / forces / dis-incentives currently at play in many classrooms that contribute to separating students from the MOM to sense make.

Task 6. Identify some of the factors / forces / dis-incentives currently at play in many schools that contribute to separating the teacher from the MOM to animate / enable / facilitate student sense making.

Task 7. Return to Task 6. Only this time, replace ‘teacher’ with one of the players listed below.

- head of department
- principal / head master of a school
- parent / primary care giver of a school student
- school board / ministry of education curriculum developer
- school board / ministry of education curriculum consultant
- school board member
- author of educational resources
- testing authority
- faculty of education instructor
- education researcher
- professional teacher organization
- politician
- business leader
- media person
- other education stakeholders

Task 8. This paper focuses on the connection between MOM and four pedagogical things, specifically, the sense-making student, the teacher animating / enabling / facilitating student sense making, assessment, and the role of rich learning tasks. I did not include a section dealing with the connection between MOM

and the environment within which learning / sense making takes place. Write a section entitled *MOM and the Learning Environment* to correct this omission.

Task 9. Evaluate a lesson you have witnessed / experienced / taught under the dimensions of MOM.

Task 10. Evaluate a commercial learning activity / task under the dimensions of MOM.

References

Flewelling, Gary with William Higginson, Teaching with Rich learning Tasks: A Handbook, 2003, The Australian Association of Mathematics Teachers, <http://www.aamt.edu.au>
The Weekend Australian Magazine, Feb 1-2, 2003, <http://www.theaustralian.com.au> <http://www.the>