Insights into the creativity process

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The components of creativity

The componential theories of creativity identify the aspects or components of individual activity that need to be in place for creative outcomes.

Amabile’s componential theory of creativity

One componential theory of creativity, proposed by Amabile (1983, 1996), identifies three components or aspects necessary for creativity. Individuals need to show:

- domain-relevant skills (i.e., knowledge, technical skills). This refers to the knowledge the person has about the subject area in which they are being creative.
- task motivation. This refers to the motivation or drive the person invests when being creative.
- creativity-relevant skills. This refers to what the person knows about how to think creatively. It includes planning and exploring new pathways, keeping options open for as long as possible, and suspending judgment.

Amabile's theory has been extensively empirically tested (e.g., Conti, Coon, & Amabile, 1996; Ruscio, Whitney, & Amabile, 1998). It has been used to predict how likely a person is to generate creative outcomes.

The Urban componential model of creativity.

This is a more elaborate model and identifies six components of human activity necessary for creativity. The components are grouped into two main areas of human activity:

Cognitive or knowledge and thinking components
- Having a high level knowledge and skills of a specific topic area
- Being able to think divergently about the topic
- Having a well developed general knowledge and thinking base

Personality or motivational and emotional components
- Having high level focusing and task commitment
- Having high intrinsic motivation and motives
- Being ‘open’ about the topic and prepared to tolerate ambiguity in the area.

Divergent thinking

This has several subcomponents:
- Fluency – how quickly you can generate ideas.
- Flexibility – how many different categories are reflected
- Originality – how ‘relevant’ are the ideas.
- Re-structuring- how well you can re-prioritise ideas or see them linked in different ways.
- Elaboration- how well you can predict or infer from some ideas to others.

The items in this component are in a developmental order. The starting point for creative thinking is problem sensitivity, the ability to see or find problems. Individuals differ in their ability to do this; a particular situation may evoke a questions in some individuals but not in
others. Most children ask questions naturally, it is an early form of verbal expressions and is closely linked with natural curiosity, the drive for exploration and knowledge.

Students can generate multi domain questions about an issue. They can ask directed questions that are based on focused, intense activity and defocused activity.

Divergent thinking is related to various emotional aspects. This type of thinking requires a level of autonomy, that involves resistance to group pressure.

**General knowledge and thinking** General deep knowledge and thinking, storing in a flexible memory, analysing, logical thinking + critical and evaluative thinking are all necessary aspects of creativity. Divergent thinking needs to be based on a broad general deep knowledge and thinking base. Fluent, flexible and associational thinking requires
- quick perception and processing of information and data,
- storage in a flexible, accessible memory network.

Students need to analyse and think logically at various stages of creativity:

<table>
<thead>
<tr>
<th>early stage</th>
<th>final phase</th>
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<tr>
<td>Think about information to generate problems</td>
<td>analyze and evaluate the outcomes of divergent thinking (reformulated, redefined or reconstructed problems) in terms of their usefulness.</td>
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<td>Think critically and evaluatively about the creative outcome and its elaboration</td>
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Need dynamic balance of general knowledge and divergent thinking for creative thinking.

**Specific knowledge base- expert knowledge** Divergent thinking by itself is insufficient for creativity; specific subject or topic mastery is also necessary. The acquisition of comprehensive and detailed area specific knowledge and skills requires disciplined topic commitment and persistence on a high level. The problem in question and the connecting thematic field has to be kept in the focus of attention over a longer period of time and with varying intensity. Concentration and selectivity are necessary for collecting, analyzing, evaluating, and elaborating information and data. Case studies cited by Weisberg in Sternberg confirm that “creativity has a strong basis in and continuity with previously existing knowledge…”(1994:297).

**Focusing and task commitment** : for creativity individuals need persistence, perseverance, task commitment.

**Motives and motivation** Professor Urban noted the need for motives and motivation, particularly intrinsic, for creative outcomes. This emerges through engagement with novel aspects of the task. He believes that the need for novelty, curiosity and a drive for exploration and knowledge are inherent to all child, is often suppressed by parents or the educational environment.

These drives need to be supported by the environment; a culture for learning. Students need to feel free to bring in new ideas into the relationship and to receive personalised feedback.

**Openness and tolerance** With focusing and task commitment, creativity needs openness and tolerance of ambiguity. Related subcomponents include a resistance to pressure from the peer group, a preparedness to maintain nonconformist behaviour and autonomy of thinking. The readiness to take risks allows individuals to make remote associations, playfulness and experimenting accompany fluency and flexibility and the tolerance of ambiguity is supported by passion. Einstein noted the need to balance between focus and defocusing.

These components with their subcomponents are shown in the following figure:
Divergent thinking and acting
- Elaboration
- Originality
- Remote associations
- Restructuring and redefinition
- Flexibility
- Fluency
- Problem sensitivity

General knowledge and thinking base
- Metacognition
- Critical and evaluative thinking
- Reasoning and logical thinking
- Analysing and synthesising
- Memory network
- Broad perception

Specific knowledge base and area specific skills
Acquisition and mastery of specific knowledge and skills in specific areas of creative thinking and doing; expertise

Integrated cognitive–affective system for thinking creatively

Openness and tolerance of ambiguity
- Openness for experiences,
- Playfulness and experimenting,
- Readiness to take risks,
- Tolerant of ambiguity,
- Regression and relaxation,
- Defocusing humour

Motives and motivation
- Intrinsic motivation, need for novelty, curiosity,
- Drive for exploration
- Self actualization
- Devotion and duty
- Need for control
- Resistance to group pressure
- Maintain nonconformist behaviour and autonomy of thinking.

Values of the model: it can be used to
- Develop educational opportunity
- Understand the processes of creativity
- Evaluate, accept and appreciate creative outcomes

What would each component actually look like in teaching?

Divergent thinking
- Does anything happen that could be called divergent thinking?
- Is teacher sensitive to problems, questions of students? Does she/he make students aware of problems?
- Does time organisation allow more than one attempt at solution to problems?
- Are topics examined from different aspects?
- Is there a critical openness for redefinition and reformulation?
- Is a deviant way or solution appreciated?
- Are problems offered that are open ended vs ill-structured, closed?
- Does the teaching encourage students to question ideas at a number of levels and generate their own problems?
• Does the teaching encourage students to explore ideas from different perspectives, are we allowing any and all answers, are we positively valuing ideas from all perspectives?
• What classroom procedures for promoting divergent thinking are used?
• To what extent does the teaching
  • Encourage individuality?
  • Model how to think, learn creatively by teachers?
  • Give students the opportunity to work collaboratively?
  • Give students the opportunity to explore ideas?
  • Ensure questions are open-ended, challenging?
  • Give choice in completing tasks?

General knowledge and thinking base

• For what reason are you developing all the aspects of the area? School needs to know why they are developing this area. Are they instructed or doing it through interest?
• What do teachers know about all of these aspects at their conceptual level? How would they implement each key area?
• Are these areas embedded in all teaching or are they added on at the end of the teaching?
• What qualities do you see in your staff that would reflect identify each of these in their teaching?
• Do staff have good questioning skills? Can you develop these in staff through modelling?
• Do the teachers have a great passion for their subjects? Can passion be developed in teachers?
• Do learning tasks require broad different perceptions or restrict focus?
• Do teachers ‘talk the talk’ or ‘walk the walk’? Do teachers understand reasoning, divergent thinking?
• Does learning use different sense channels? Varying ways and methods so that knowledge is accessible in various ways?
• Are ‘why’ questions asked?
• Is there teaching of systematic analysis and synthesising of problems, topics, facts?
• Are there challenges for inductive and deductive reasoning?
• Is evaluation asked for?
• Is the learning process observed and reflected?

Specific knowledge base and specific skills

• Is the development of special interests in students encouraged? Extra curricula provisions?
• Are individual interests brought or built into school work so that children can show intrinsic interest?
• Opportunities for possibilities for students to pursue in-depth studies for topics being covered?
• Opportunities of research projects for students and for self directed learning?
• Do students build up a special competence profile?
• IS expertise valued?

Focusing and task commitment
• Is there a community of purpose in the classroom?
• Has teacher discovered what students
• Is longer occupation with a special interest valued
• Do we allow tasks to be completed in a variety of ways?
• Do we have students think about how they focus?
• How important is enquiry based learning?
• Are students encouraged to pursue a passion in learning?
• Does time schedule allow for these activities?
• Is task commitment required?
• IS there a chance for self control of own work?

Motives and motivation
• Do we encourage divergence of thought?
• Do we allow opportunity for genuine feedback for high level outcomes?
• To what extent is intrinsic motivation allowed?
• How does the school compromise between outcomes based demands and personal interest knowledge?
• Different learning environments motivate students to different extents?
• Is natural curiosity and strive for knowledge supported?
• Are there opportunities for self determined discovery learning?
• Can students participate in research?

Openness and tolerance of ambiguity
Ideas don’t seem to fit, taking risks, vary between focus and defocus:
• Does the classroom allow for verticality?
• Does student welcome / value ambiguity?
• Ability to self reflect?
• Can student enjoy experiences of others and see ambiguity in this?
• Are students allowed to persevere and complete tasks
• Does the structure of the school day allow students to develop in their own way / to follow their level of understanding?
• How do student spaces influence the openness?
• How is time organised?
• How are students / teachers grouped?
• Is the curriculum based on research?
• Is the curriculum design interdisciplinary?
• Is school not only a place for traditional instruction but a place for living, fun?
• Is school a place for fantasy and imagination?
• Is individuality and uniqueness of each person valued?
• Are errors and mistakes allowed during regular learning?
• Is the celebration and joy of achievements encouraged?

Education for creativity –
Avoid teaching single, separate components, for example, a lesson about fluency, a lesson about flexibility, a lesson about sensitivity training. Professor Urban recommends a holistic approach that focuses on whole-person development, developing a general creative attitude and readiness.

Provide the opportunity for intrinsic motivation. Use tasks and challenges that can be processed in multiple ways and that are open-ended, that foster a questioning attitude, that stimulate broad and open perceptions.

Divergent thinking can be used for specific area knowledge learning.

Component 6 is often neglected – we learn how to avoid mistakes, do things the right way, school is not a place for ‘musing’.

For creativity, need strong focus on self-determined learning of students

Focus on individual differentiation as well as social learning

Can’t create or train for creativity like driving a car. Need to provide the best conditions necessary for achieving it.

Development of openness to child who is creative

‘gifting’ development – is based on an open interaction with child’s social group being open rather than channeling the development of individual child. Teachers are opening agents. Teaching curriculum openers. Open learning implies several conditions.

- Enrichment of children’s perception
- Conditions for high degree of self-initiative, spontaneity and experimentation
- Accept non-conformist behaviour and apply original ideas
- Frame allowing for open role structures
- Support questioning exploring, problem solving
- Increase autonomy in learning
- Experience of social co-operative creativity
- Reduce pressure of achievement
- Atmosphere of class important. During brainstorming, agree on common rules, e.g., free to say what you want.

Generally, to foster creativity in teaching

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<tr>
<th>Where</th>
<th>What</th>
<th>How</th>
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<tr>
<td>Classroom</td>
<td>Curriculum</td>
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<td>The world</td>
<td>Tasks</td>
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<td>Special programs</td>
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<td>Classroom environment</td>
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Creativity nurturing in schools

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<tr>
<th>Whom</th>
<th>Why</th>
<th>Who</th>
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<tbody>
<tr>
<td>School community</td>
<td>Lifelong capacity</td>
<td>everyone</td>
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