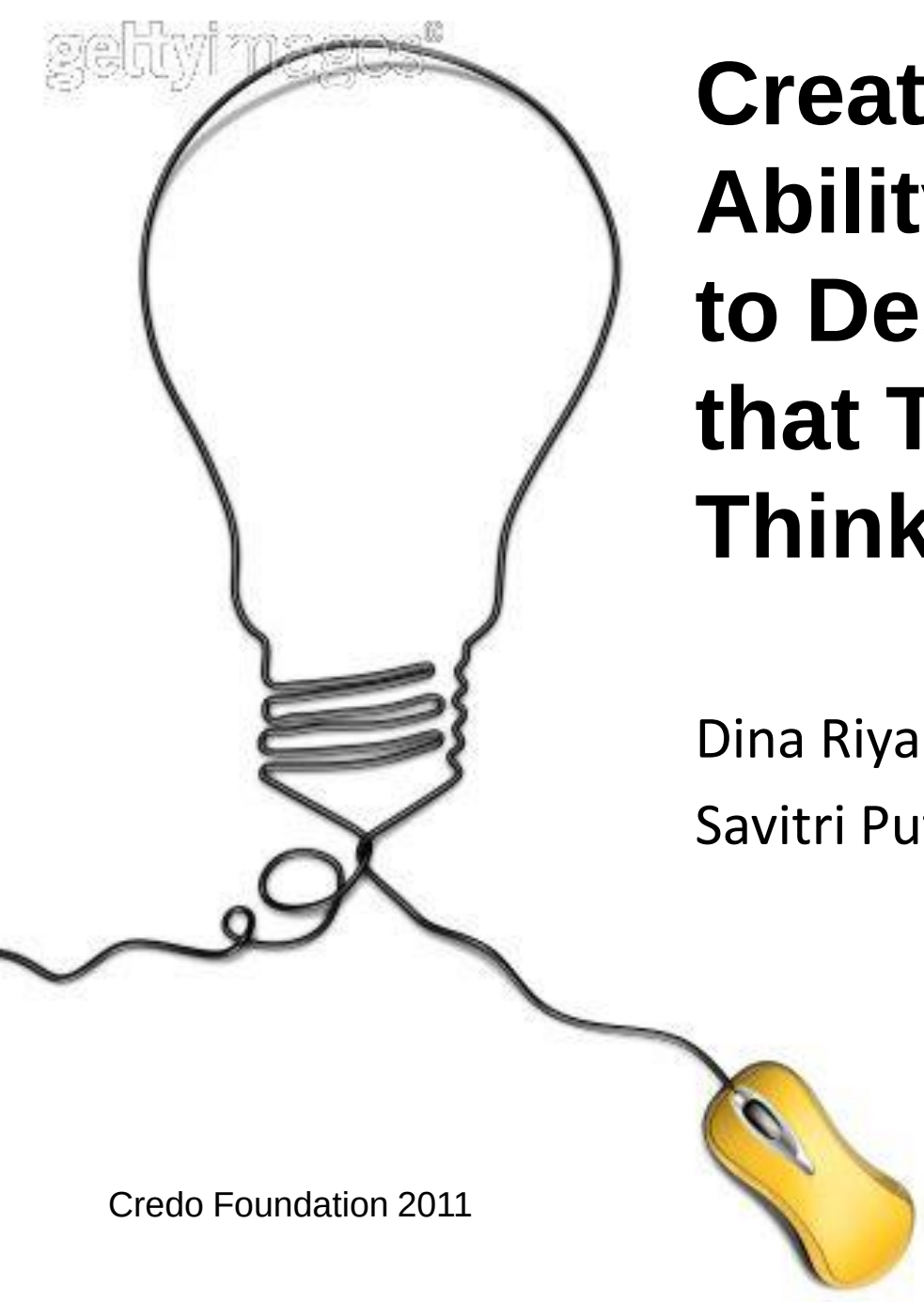

Creative Ability and the Ability to Design Lesson Plans that Teach Creative Thinking

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Acknowledgement

Thank you to Kayee Man, for her guidance in this study;

Also to Trimadona Koeswoyo, for helping us with our data analysis.

What is CREATIVITY?

What is CREATIVE THINKING?

Is CREATIVE THINKING important?

This paper will adopt Cropley's (2001) aspects of creativity:

CREATIVITY is...

a product that is new, effective and ethical.

CREATIVE THINKING is…

the thinking skill to solve a problem effectively

in a new and ethical way.

Is CREATIVE THINKING important?

In the context of Indonesian education:

YES.

The Indonesian Ministry of National Education has already acknowledged the importance of creating a creative generation that has creative ability to think creatively *(Indonesian Ministry of National Education strategic plan 2010 – 2014 page 56).*

Thus, it is clear that one of the missions of teachers in Indonesia is:

to encourage the ability of creative thinking in their students.

How to achieve the mission?

One way to achieve it is *to design a lesson plan that teach creative thinking.*

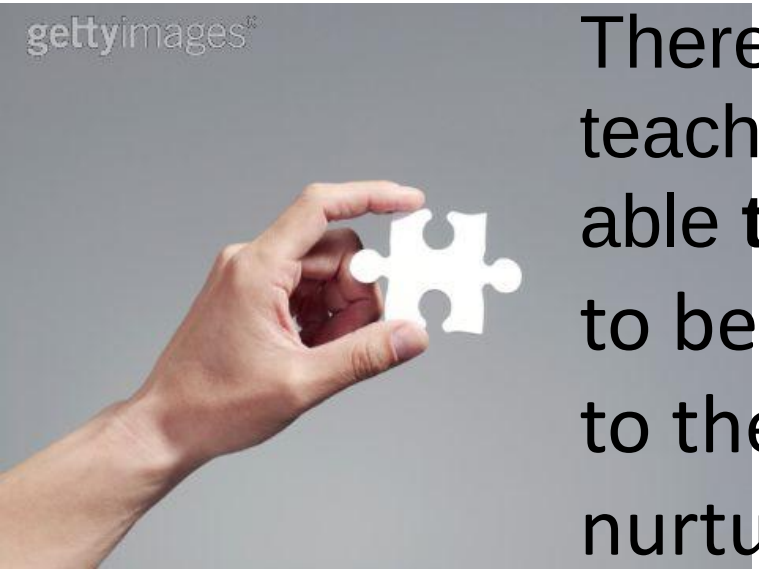
Credo, a non-profit organization based in Jakarta, tries to help teachers to achieve the mission.

In collaboration with **The Faculty of Early Childhood Education at the State University of Jakarta, Indonesia**, we designed and taught a course in *Designing Lessons that Teach Creative Thinking* (“the course”).

The course was taught to teacher students in their third year of undergraduate studies in 2011 (“the teacher students”).

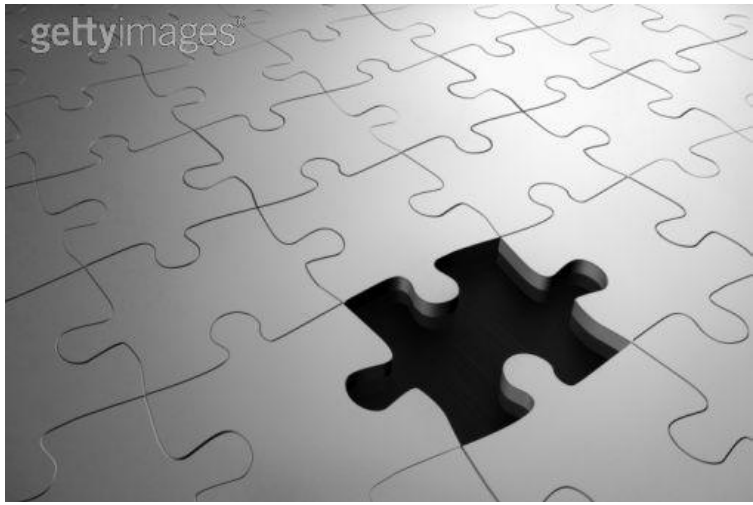
Teachers are ROLE MODELS to their students.

Bandura's (1977) *Social Learning Theory* underlines the teacher as role model as a tacit/implicit way of teaching students to be creative individuals.



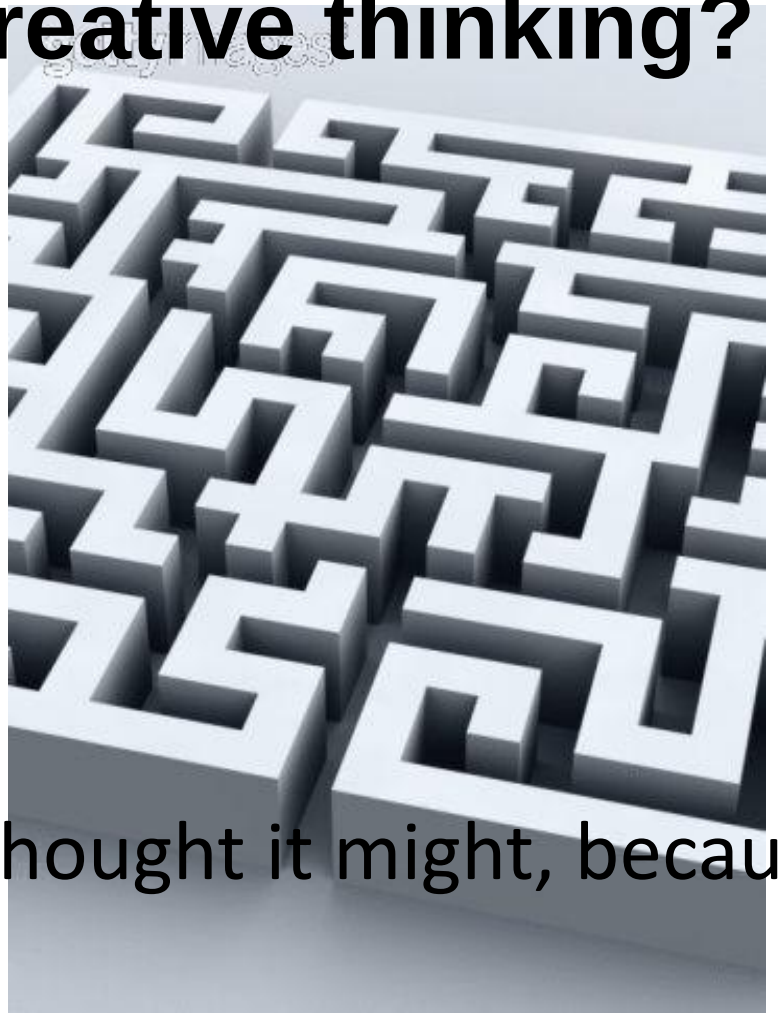
Therefore, we construe that teachers themselves should be able **to think creatively** to be able **to teach creative thinking** to their students and nurture the students' creative ability.

Davis (2004) concluded:
"In improving our own creativity and in teaching creativity to others, it (being aware of one's creativeness) is the number one trait to develop." (p.87).



Torrance and Safter (1990) pointed out that it takes courage to be a creative teacher as creative teaching behaviours involve risk.

Does a teacher's creative thinking ability correlate to his/her ability to design lesson plans that teach creative thinking?



We thought it might, because…

1. A person needs to master a topic to be able to teach it. Therefore, teachers need to be able to think creatively to be able to teach it.

2. Creative thinking is closely linked with **problem solving**.

As Torrance (1963) noted:

"Learning and thinking creatively take place in the process of sensing difficulties, problem, gaps in information; in making guesses or formulating hypotheses about these deficiencies; in testing these guesses and possibly revising and retesting them; and finally in communicating the results."

The assignment to make a lesson plan that teach creative thinking can be perceived as a **problem that has to be solved** by the teacher students.

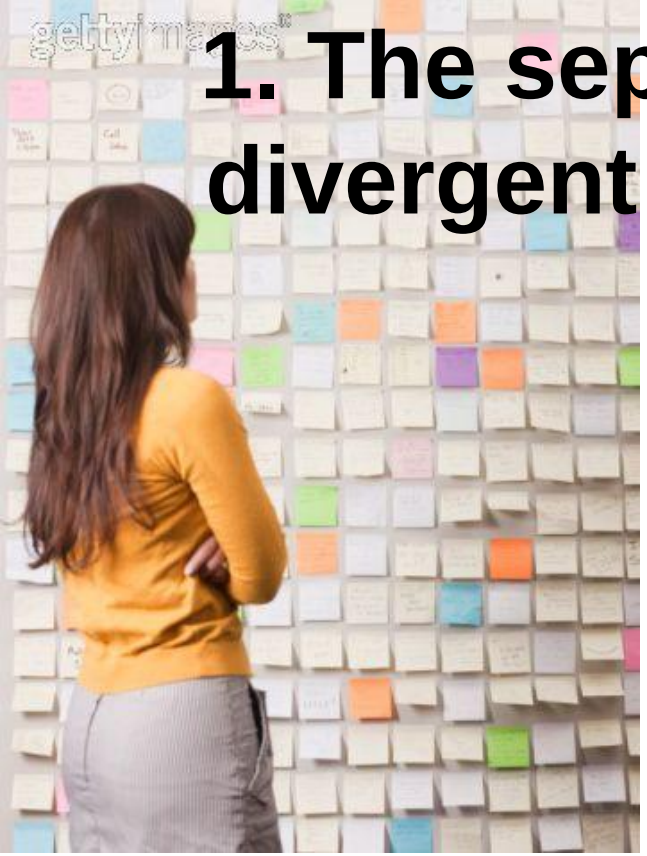
Regarding to what Torrance has stated previously, we assumed that the teacher students' creative thinking ability should affect how they solved that problem.

How can a lesson teach creative thinking?

Creative thinking can be taught in a lesson if a teacher deliberately incorporates one or more of the following into a lesson:

①the separation and balance of divergent and convergent thinking
②stimulation of students' imagination
③development of students' thinking languages
④allowing for students incubation of learning
⑤development of one or more of the 18 creative thinking skills from the Torrance Incubation Models.

We taught all aspects above to the teacher students,
with the exception of 18 TIM creative thinking skills.



1. The separation and balance of divergent and convergent thinking

Some models have been developed that emphasize the role of both divergent and convergent thinking in the creative thinking process. E.g., the Creative Problem Solving, a creative process model that has benefited from more than 50 years of academic research. (Isaken et al1994; Treffinger, 1995; Miller et al, 2001; Puccio and Murdock, 2007)

The National Advisory Committee on Creative and Cultural Education Report UK (1999) stated that:

It should be the aim of education to help students differentiate and separate generative and evaluative thinking.

2. Stimulation of students' imagination

✧The role of imagination cannot be divorced from either divergent or convergent thinking.
(Puccio and Murdock, 2007)

✧*Enjoy and Use Fantasy* (the ability to imagine) was identified as a pertinent creative thinking skill by Torrance and Safter (1999).

✧ Of course, in order to make the students able to deepen their understanding on what they are learning, *the imagination that the students practice should derive from the topic learnt.*

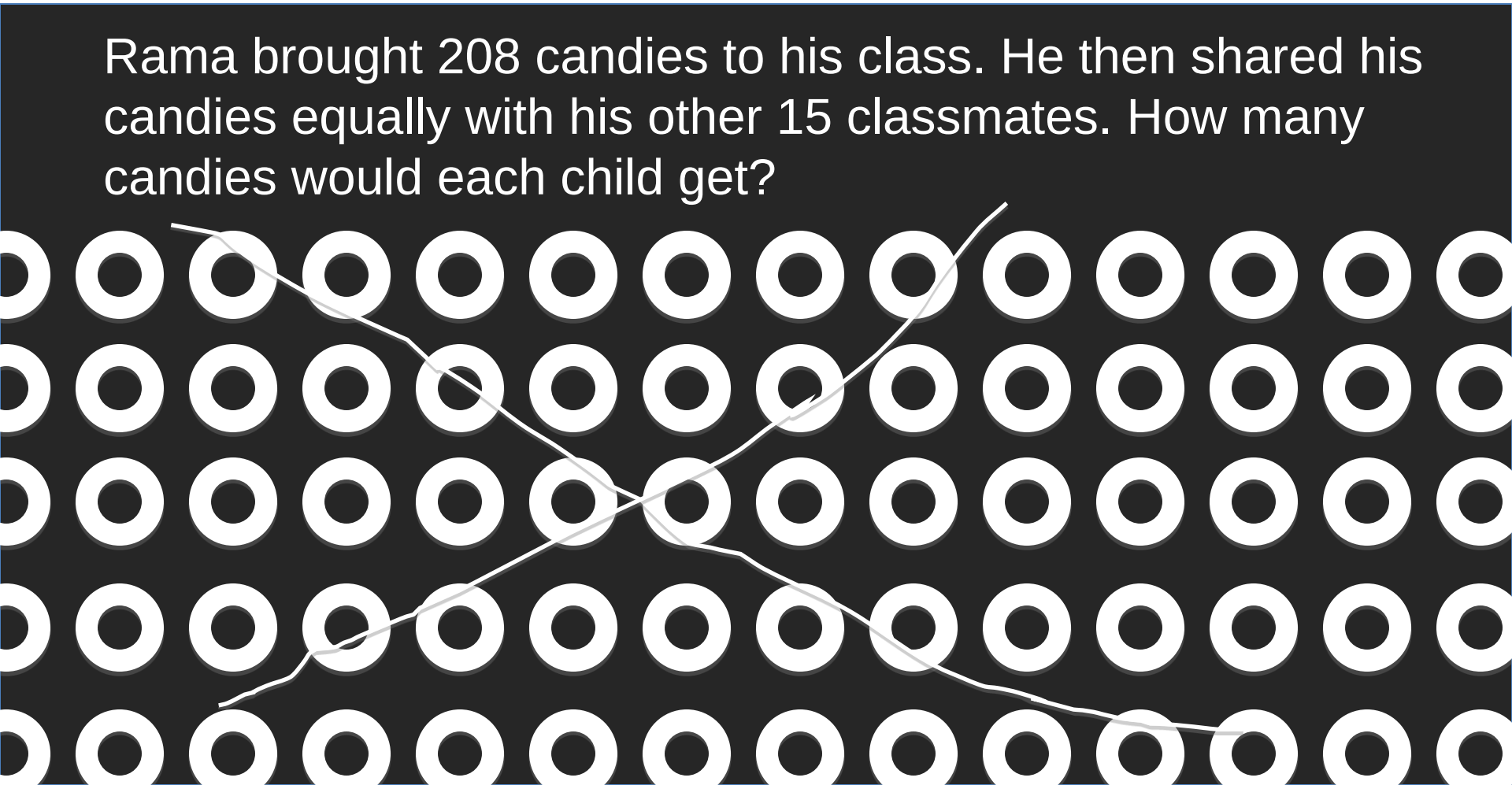
3. Development of students' thinking languages

Gardner (1983), in his Multiple Intelligence theory, said that individuals have different intelligence profiles with which they apply in thinking or problem-solving.

Adams (2001) also wrote that people tend to solve a problem by choosing a thinking language that they are most comfortable with.

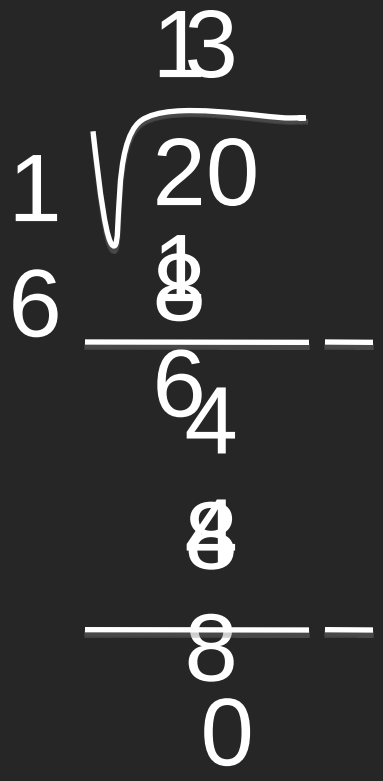
Oza has just bought 9 candies. On his way home, he met Chika and Syalwa. Oza then shared his candies equally with his friends. How many candies would each child get?

However, Adams (2001) suggested that our habitual choice of problem solving language is not necessarily the one that is best to solve the problem we face.



Therefore, we should be **flexible** in using different problem-solving languages or modes of thinking.

Which means that students should be encouraged to practice multiple intelligences or different modes of thinking in order to widen their problem solving abilities.



Each child will get 13 candies

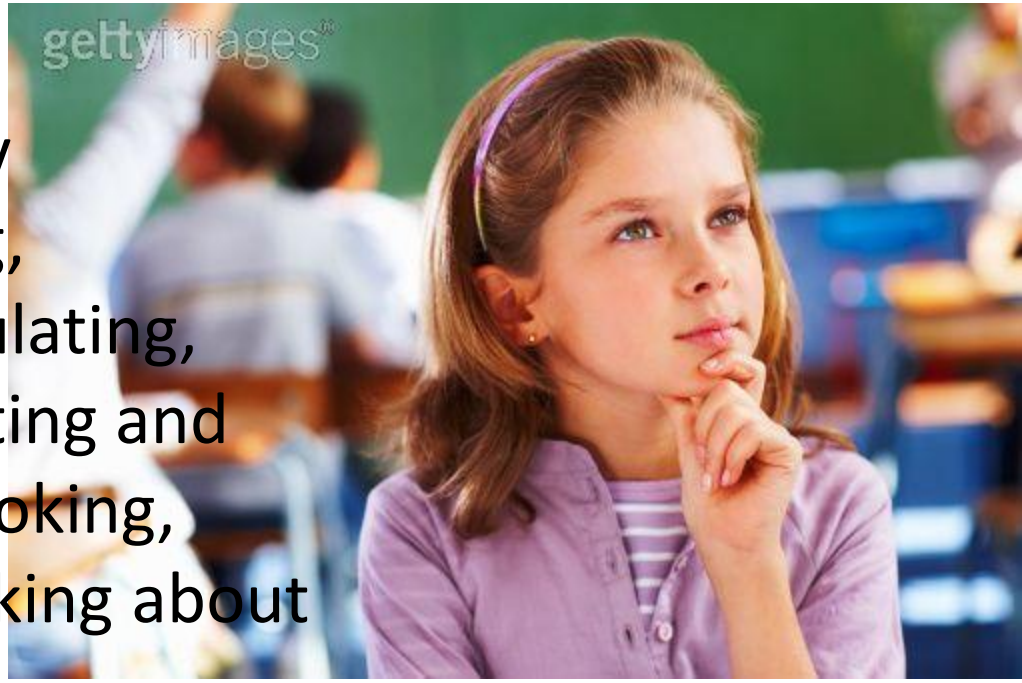
4. Allowing for students' incubation of learning.

5. Development of one or more of the 18 creative thinking skills from the Torrance Incubation Models.

Torrance believed that

people learn creatively by

> "exploring, questioning, experimenting, manipulating, rearranging things, testing and modifying, listening, looking, feeling – and then thinking about it – incubating."



(Torrance & Safter, 1990; p.13).

He developed a model in teaching – the **Torrance Incubation Model (TIM)**, which has 2 aspects:

✧Three stages of teaching (warming up, digging deeper and keeping the learning going). Each stage contains a set of recommended teaching strategies that encourage student thinking and incubation.

✧A set of 18 creativity skills or creative thinking skills (Torrance, 1979; Torrance & Safter, 1999), one or more of which are meant to be woven into the teaching process.

We do not teach 18 creativity skills to the students, due to the limitation of time.

METHODOLOGY

For this study, we define lesson plans that teach creative thinking to be ones that include the following :

①Multiple Intelligence

②TIM – three stages of learning

③Creative Process (CP - separation and balance of divergent and convergent thinking)*

④Stimulation of imagination

Creative Process:

It is a structure of creative thinking process that is developed by Credo, with specific attention on the separation of divergent and convergent thinking and the explicit use of imaginative thinking in a lesson.

The creative process consists of:

① **Knowledge introduction:** The stage where the knowledge is introduced and taught to the students.

② **Imagination:** The stage to dig the students' imagination based on the topic learnt.

③ **Expression:** The stage for the students to express their ideas and thoughts that have been generated in Imagination stage.

④ **Reflection:** The stage for the students to rethink what they have learnt, to extract what experiences and knowledge that they have gained.

The teacher students' creative thinking abilities were measured by way of *the Abbreviated Torrance Test for Adults (ATTA)* (Goff and Torrance, 2002).

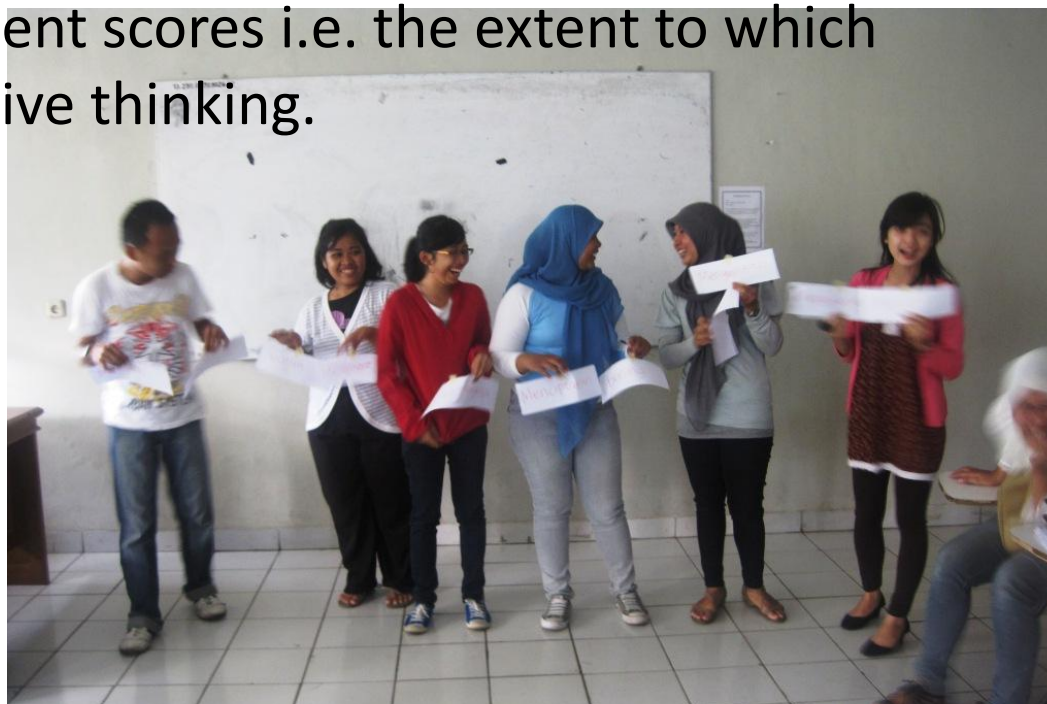
The ATTA was administered in the first session of the course before the teaching of any course materials, and a post test was administered after the final semester examinations.

✧ A total of three out of nine course assignments' scores of each component (MI, CP, TIM three stages of learning) were analyzed for the purpose of this study.

✧Three of the lesson plans components' scores were compared to the ATTA scores.

✧Pearson's correlation coefficients were used to establish whether the teacher students' pre course ATTA scores were correlated with their assignment scores i.e. the extent to which their lesson plans teach creative thinking.

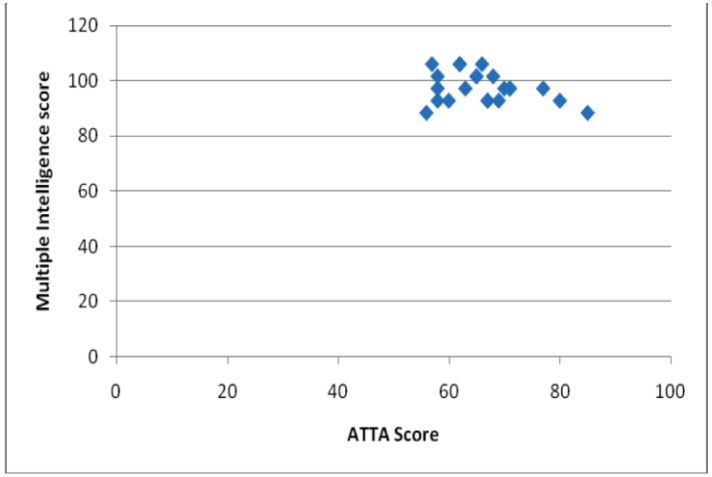
✧This study analyzed the ATTA and assignment scores of said 22 teacher students.

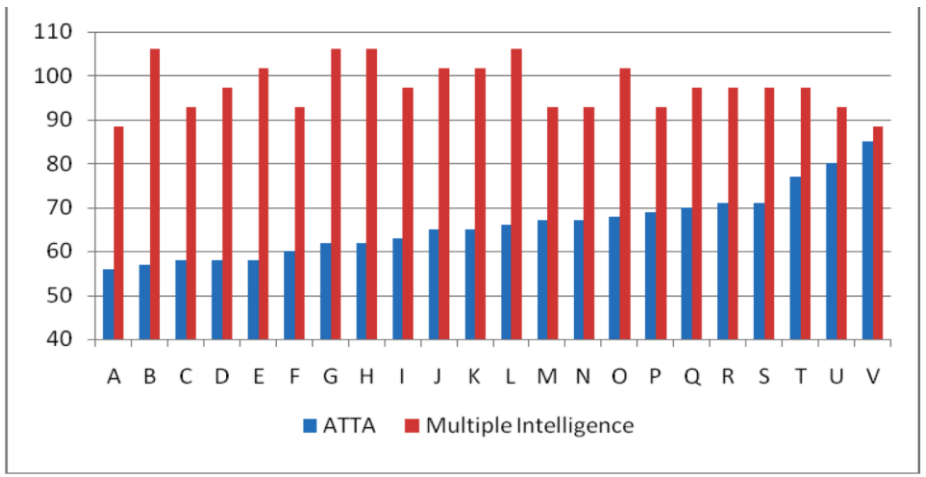


THE RESULTS

Because the highest score achievable in ATTA is 106, the assignment scores were scaled to a maximum of 106 for visual depiction and comparison of the two scores.

1. Multiple Intelligence



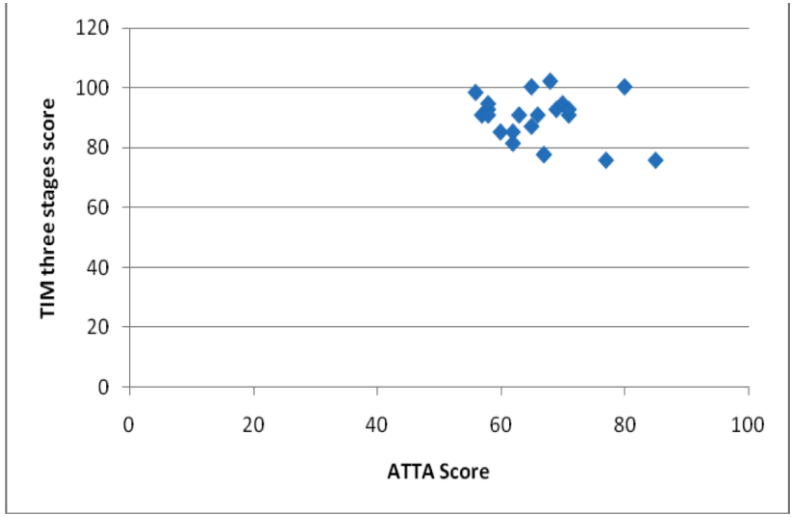


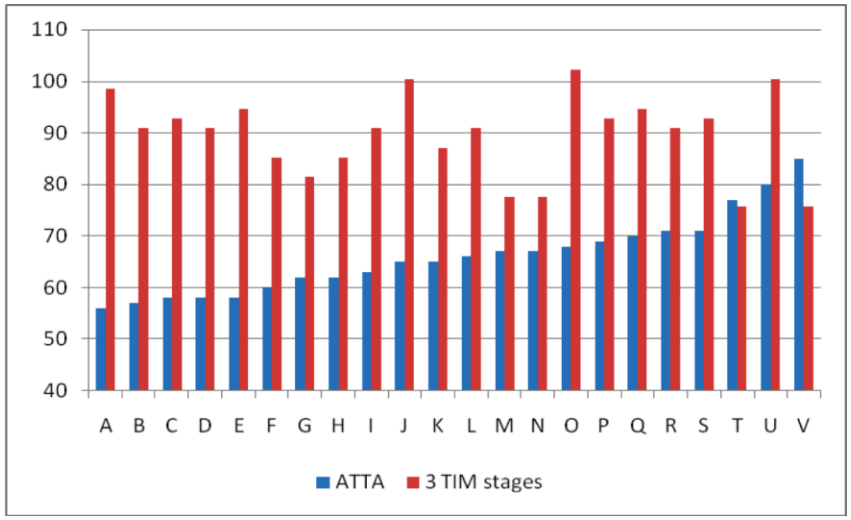
✧The scores for the MI assessment are of truncated or restricted range which meant the correlation coefficient of -0,042308 may be lower than the estimate population correlation coefficient.

✧In this case, the MI data was distributed in the upper scores level (above 80 out of a total of 106) as is shown in Table 1 above.

✧The results indicate that *teacher students were able to apply MI effectively in their lesson plan designs regardless of their ATTA scores*.

2. TIM Stages Of Learning





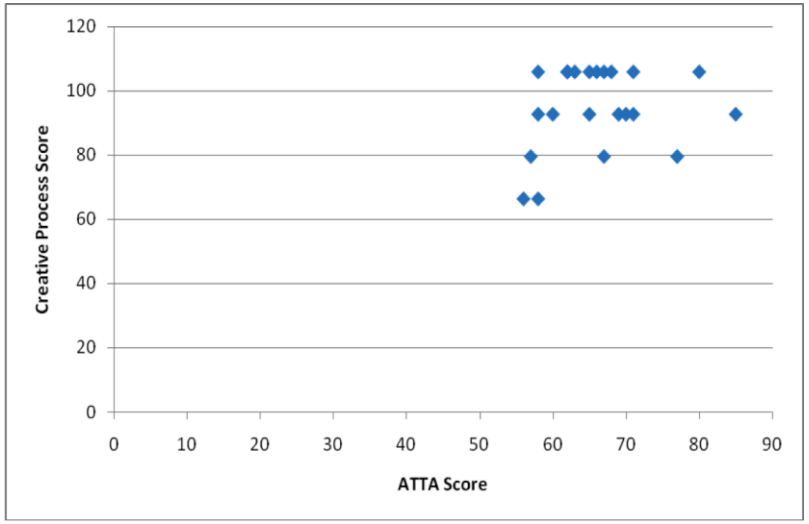
- The scores for TIM three learning stages assessment are of truncated or restricted range which meant the correlation coefficient of -0,26359 may be lower than the estimate population correlation coefficient.
- In this case, the TIM three learning stages scores were distributed in the upper scores level (above 75 out of a maximum of 106) as is shown in Tables 3 and 4 above.
- The results indicate that *teacher students were able to apply TIM three learning stages effectively in their lesson plan designs regardless of their ATTA scores.*

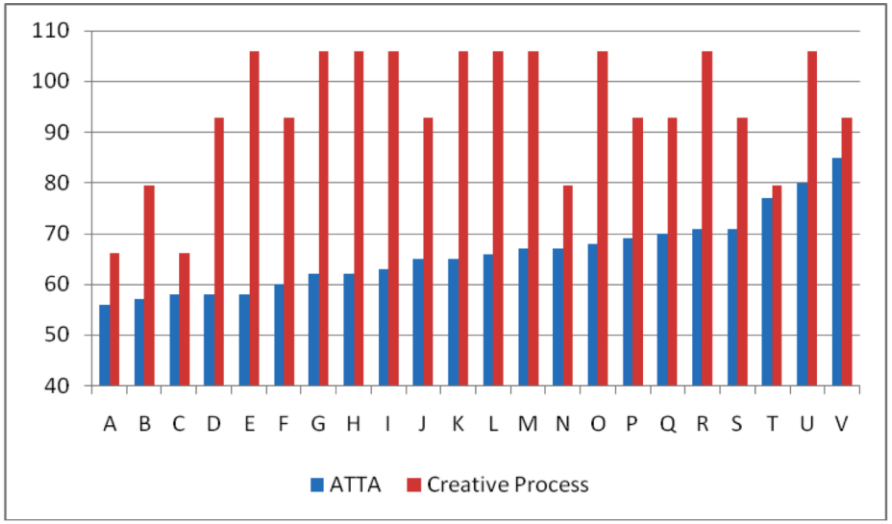
Given the overall high scores of this group of teacher students, it appears that *creative thinking abilities may not be a prerequisite for this group of teacher students to be able to incorporate MI and TIM three stages of learning into teaching activities design*.

This may be due to the *straightforward frameworks* afforded by MI and TIM within which the teacher students could work.

We therefore suggest that *sufficient knowledge and the adherence to the frameworks provided by MI and TIM may suffice* for teacher students to design lesson plans that develop MI and encourage incubation in students.

3. Creative Process





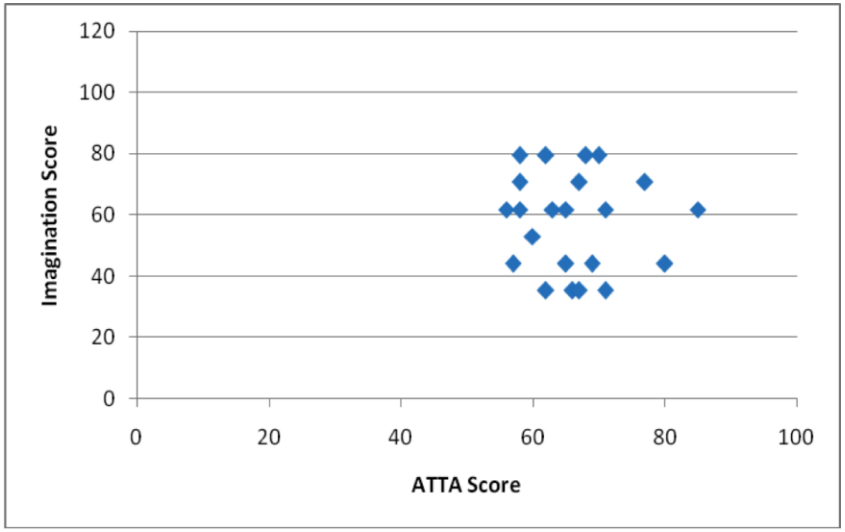
✧ A correlation coefficient of 0.22 indicates a positive but weak association between creative ability and the ability to design lesson plans that incorporate a creative process (CP).

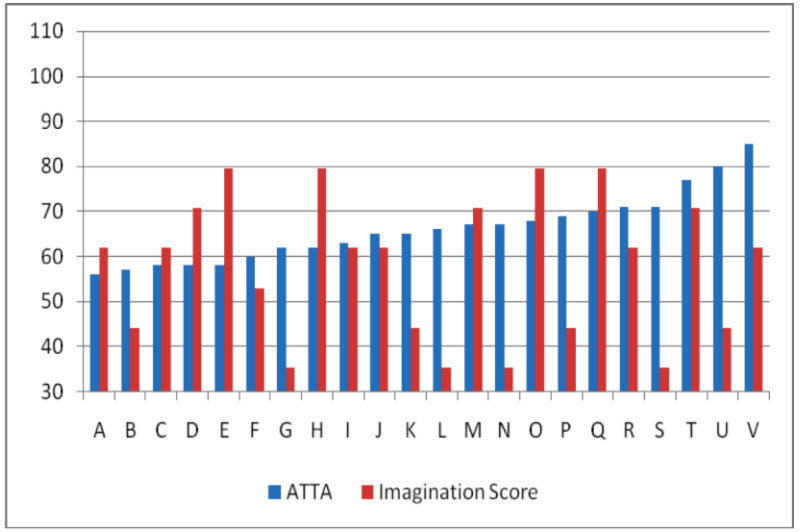
Interestingly, the range of assessment scores found for the CP assessment was overall lower than those of the MI and TIM assessments.

This suggests that it was more challenging for the teacher students to design a learning process than to design MI activities or apply the TIM three stages of learning.

This may be due to the fact that the CP involves several elements (knowledge building, knowledge exploration, imagination and expression) and indicates that this group of teacher students found it more challenging to chain together several elements within a learning process.

4. Stimulation Of Imagination





- A correlation coefficient of -0.07 indicates a near absence of association between creative ability and the ability to design lesson plans that incorporate a teaching activity that stimulates imagination.

- Nevertheless in table above, we notice that the stimulating imagination assessment scores were generally low (between 30 to 80 out of a maximum of 106) compared to the other assignments included in this study.

Unlike the application of MI and TIM three stages of learning which provide some framework or structure and knowledge base for lesson designers to work within, thinking up activity ideas to stimulate learners' imagination is a much more open-ended task:

The lesson designer needs to be able to consider **what can be imagined** or what are the new perspectives or ideas that can be stimulated based on the teaching contents.

Thus, the lesson designer should be able **to stretch beyond the known or to play around with ideas**, hence the postulated need for creative thinking ability (Torrance and Safter, 1999).

However, no correlation was found between creative abilities and the ability to incorporate activities that stimulate learners' imagination in a lesson plan.

This is intriguing.

The ability to perceive problems from fresh perspectives is considered to be essentially the thinking skill required to think up activities that stimulate imagination in a lesson plan.

Could this assumption be wrong or could it be that the ATTA scores do not capture this

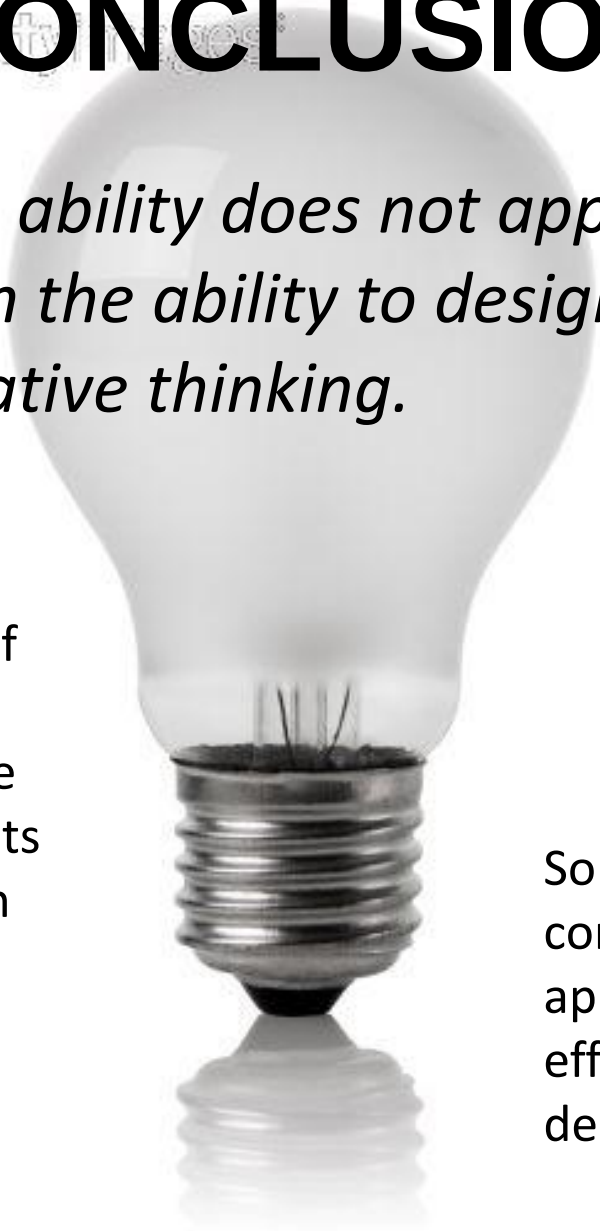
Another point is that overall, *the teacher students found it challenging to think up teaching activities for stimulating imagination,* as indicated by the low range of scores.

If the creative thinking components of MI, incubation (as allowed for by TIM three stages of learning), and a creative learning process can be developed by the teacher students by providing them the knowledge of the relevant theories, models and frameworks, then…

what might be the underlying thinking abilities that would be necessary for teacher students to be able to design activities that stimulate learners' imagination effectively?

CONCLUSION

Creative thinking ability does not appear to be correlated with the ability to design lesson plans that teach creative thinking.



Providing the theories, models and frameworks of MI, CP, TIM Stages of Learning are thought to be helpful for teacher students to use as a guide to design lesson plans that teach creative thinking.

Some knowledge of common teaching ideas appear to suffice for effective lesson plan designs.

However, without a clear framework or related knowledge base to generate activity ideas*, the teacher students overall did not do well on designing activities that stimulate imagination; no matter how high their ATTA scores were.*

Therefore, it would be informative for the development of future lesson planning courses *to investigate why this is the case and what might be the underlying thinking skills necessary to think up imagination stimulation activities, and whether and how these thinking skills might be taught*.

LIMITATION/WEAKNESS

- ✧The small sample size of the teacher students restricts the generalizability of the results of this study.

- ✧Given the one semester long time constraint to teach the course on designing lesson plans that teach creative thinking, only what were construed to be the basics of creative thinking could be included in the course contents and hence a restricted definition of creative thinking was applied to the course and hence this study.

References

•Adams, J. L. (2001). Conceptual blockbusting (4th ed.). NY: Basic Books.
•Anderson, L. W. & Krathwohl, D. R. (Ed.). (2001). A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives. NY: Addison Wesley Longman, Inc.
•Bandura, A. (1977). Social learning theory. NY: General Learning Press.
•Cropley, A. (2001). Creativity in education & learning: a guide for teachers and educators. VA: Kogan Page Limited.
•Csikszentmihalyi, M. (1996). Creativity. NY: HarperCollins Publishers Davis, G.A. (2004). Creativity is forever (5th ed.). Iowa: Kenall/Hunt Publishing Company.
•Gardner, H. (1983). Frames of mind: The theory of Multiple Intelligences. NY: Basic Books.
•Gardner, H. (1999). Intelligence reframed. NY: Basic Books.
•Gardner, H. (2006). Mulitiple Intelligences: New horizons. NY: Basic Books.
•Goff, K. & Torrance, E. P. (2002). Abbreviated Torrance Test for Adults Manual. Scholastic Testing Services, Inc.
•Guillford, J.P. (1977). Way beyond the IQ: guide to improving intelligence and creativity. NY: Creative Education Foundation.
•Isaksen, S. G., Dorval, K. B. & Treffinger, D.J. (1994). Creative approaches to problem solving. Iowa: Kendall/Hunt Publishing Company.
•Miller, B., Vehar, J. & Firestien, R. (2001). Creativity unbound: An introduction to creative process. NY: Innovation Resources, Inc.
•Puccio, G. J., Firestien, R. L., Coyle, C. & Masucci, C. (2006). A review of the effectiveness
•of CPS training: A focus on workplace issues. Creativity and Innovation Management, 15(1), 19-33.
•Puccio, G. J., Murdock, M. C., & Mance, M. (2007). Creative leadership: skills that drive change. CA: Sage Publications.
•Runco, M. (2007). Creativity: theories and themes: research, development and practice. MA: Elsevier Academic Press.
•Torrance, E. P. (1963). Education and the creative potential. Minneapolis: The University of Minnesota Press.
•Torrance, E. P. (1979). The search for satori and creativity. NY: Bearly Limited
•Torrance, E. P. & Safter, H. T. (1990). The incubation model of teaching: getting beyond the aha! NY: Bearly Limited.
•Torrance, E. P. & Safter, H. T. (1999). Making the creative leap beyond. MA: Creative Education Foundation Press.
•Treffinger, D. J. (1995). Creative problem solving: overview and educational implications. Educational Psychological Review, 7, 301-312.
•Harris R. (1998) Introduction To Creative Thinking. http://www.virtualsalt.com/crebook1.htm