

**Designing Lessons that Promote Creative Thinking – The Torrance  
Incubation Model as a Lesson Design Framework**

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**Abstract**

A study was undertaken in an educational organization for children age three to 12 years old, in Jakarta, Indonesia, as part of its search for a teaching model to employ as a framework to design lessons that developed creative thinking skills.

As ‘one of the few teaching models in the domain of creativity whose major purpose is the design and delivery of creativity content’ (Murdock & Keller-Mathers, 2002), The Torrance Incubation Model (TIM) developed by Torrance and Safter (1990) was selected as a teaching model for further investigation. Specifically, the study aimed:

1. To study how the TIM can be used as a framework for designing lesson plans.
2. To investigate whether there is a qualitative difference between lesson plans designed before the introduction of the TIM and lesson plans designed using the TIM as a design framework

It was recommended that the TIM be adopted as a lesson plan design framework and that the TIM be used deliberately in order to expand the range of the TIM teaching strategies used and ensure the systematic development of a range of creativity skills. Lesson plans should focus on the development of one creativity skill only to allow students more focused practice in using the skill.

Keywords: Torrance Incubation Model, lesson design, creative thinking skill.

## 1. Introduction

This paper documents a case study undertaken in an organization called Art Explore (AE) in the summer of 2006. The purpose of the case study was (a) to study how the Torrance Incubation Model (the “TIM”) (Torrance and Safter, 1990) can be used as a framework for designing lesson plans and (b) to investigate whether there is a qualitative difference between AE lesson plans designed before the introduction of the TIM to AE and AE lesson plans designed using the TIM as a design framework. An overview of the TIM can be found in Appendix A.

This study served the practical purpose to inform AE’s decisions for change in its lesson design process. The TIM was selected for study because it was a teaching and learning model that explicitly includes the teaching of creativity skills during the process of learning. As developed by Torrance and Safter (1990), the model intends to increase the occurrence of incubation in learners.

AE is an organization that had a focus on developing creative thinking in children by designing and delivering a program for three to twelve year olds (the “Creativity Program”). The aim of the program was to teach children creative thinking skills and develop the creative attitude. The medium used for children to communicate their ideas was visual arts. Based on Lowenfeld and Brittain’s (1987) research and in house experimentation, AE had determined that students be taught in the following age groups: three and four year olds (“e3-4”), five and six year olds (“e5-6”), seven and eight year olds (“e7-8”), and nine to twelve year olds (“e9-12”). For ease of reference, the age groups e3-4 and e5-6 will be referred to as “e3-6” and the age groups e7-8 and e9-12 will be referred to as “e7-12”.

A Creative Director designed the Creativity Program and its project objectives, which were developed into lesson plans by teachers. All teachers were provided with an in-house two plus one month (workshops plus practical) training to prepare them to teach the Creativity Program.

The Creativity Program was offered on a weekly basis to students who took lessons in AE’s studio as an extra curricular activity. Lessons for e3-6 lasted one hour. Lessons for e7-12 lasted one and a half hours. The students and teachers met once a week. Projects were completed in the studio.

The Creativity Program projects were designed with various objectives: Creativity objectives, artistic objectives, subject matter objectives (knowledge base) and imagination objectives (imagination base), (see Appendix B for a sample Project Description). Since the focus of the program was on creative thinking, the artistic objectives were limited to media and artistic concepts exploration. Therefore, the role of visual art in the Creativity Program was that of a language of expression for children. Two different AE teachers designed lesson plans for two different sets of objectives, namely for e3-6 and for e7-12. Typically, the lesson plans for e3-4 and e5-6 were similar with variations in the artistic or creative thinking challenges. Similarly, one lesson plan was designed for e7-8 and e9-12 with variations in the artistic or creative thinking challenges for the two age bands.

As there was an ‘imagination base’ (which stated a platform for students’ imagination to be triggered) in each project description, which in turn was designed in to a lesson plan, the TIM creativity skill of *Enjoy and Use Fantasy* was built into each project. Furthermore, the skill of *Visualize It Richly and Colorfully* was also inherent in each

project as all students were required to visualize their ideas with artistic media, which varied from project to project.

The TIM was introduced to the AE teaching team (the “TIM team”) for consideration of ways that it might enhance the Creativity Program and its planning and delivery.

## **2. Literature Review**

Torrance (Torrance and Safter, 1990) believed that people are naturally inquisitive and satisfy their cognitive and aesthetic needs by creative learning (Torrance & Safter, 1990). Furthermore, 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). The TIM was formulated so teachers could design more effective lessons – lessons that call for students’ thinking and engagement rather than being passive recipients of what the teacher has to say.

Since it’s original development from 1949 to 1966 as a teaching model for reading, the TIM has been taught to and used by graduate students at the University of Louisville, University of Georgia (Torrance & Safter, 1990) and has been used at the International Center for Studies in Creativity for more than fifteen years (Murdock & Keller-Mathers, 2002). As ‘one of the few teaching models in the domain of creativity whose major purpose is the design and delivery of creativity content’ (Murdock & Keller-Mathers, 2002), the TIM has the usefulness in enhancing incubation in learners and including a creativity skills set that can be integrated with contents from other disciplines. What this means is that students learn discipline contents while putting their creative thinking skills to use. In their recent work, Murdock and Keller-Mathers have presented the TIM as a metatheoretical model for deliberate training of creativity skills and its history and overview with up to date research and applications (Murdock and Keller-Mathers, 2008a, 2008b).

## **3. Method**

The TIM team received training over five sessions of approximate duration of three and a half hours per session, in a period of two months from June 2006 to August 2006. Details of the training can be found in Appendix C.

To study how the TIM could be used as a framework for designing lesson plans, the TIM team was asked to use the TIM twice, to design: (a) a lesson for non-AE contents of their own choice (“Application 1”) and (b) AE lesson plans (“Application 2”). For Application 1, the TIM team was asked to design lesson plans using the TIM without specific instructions in how the TIM should be used – this acted as a warm up activity for the TIM team to explore the different ways the TIM could be used and hence be acquainted with the teaching model. Participants were asked to choose contents of their choice (of which they should be familiar) and use the TIM as a framework to design a lesson plan to teach the contents. The resulting lesson plans were shared and discussed. Personal reactions to the design activity using the TIM were also shared. The outcome and learning from Application 1 formed the basis for the two different ways of using the TIM in Application 2. For Application 2, the TIM team was asked to select a project from the AE Creativity Program and design two lesson plans based on the same project description using the TIM in two different ways, namely: (a) to interact with the TIM freely and

spontaneously and (b) deliberately, that is, to select one creativity skill from the TIM creativity skill set and be more deliberate about the TIM teaching strategies used. For Application 2, a total of three AE projects were developed into six lesson plans. Details of said project descriptions can be found in Appendix D, E, and F. The results from the two different ways of using the TIM were analyzed by way of the resulting lesson plans and the reactions and reflections of the TIM team regarding the use of TIM.

In order to investigate whether there was a qualitative difference between AE lesson plans designed before the introduction of the TIM to AE (“pre-TIM lesson plans”) and AE lesson plans designed using the TIM as a design framework (“TIM lesson plans”), pre-TIM lesson plans and TIM lesson plans were analyzed in three ways: pre-TIM lesson plans were analyzed for whether (a) the TIM stages, teaching strategies and creativity skills appeared in the lesson plans and (b) whether teachers have a preference in the selection of teaching strategies and creativity skills when the TIM was used as an analysis framework; and (c) pre-TIM lesson plans and TIM lesson plans from Application 2 were compared using the TIM as a framework of analysis.

A total of sixteen pre-TIM lesson plans were analyzed for the presence of the TIM elements. In addition to the three pre-TIM lesson plans of the AE projects selected by the TIM team for Application 2, a further thirteen pre-TIM lesson plans (seven lesson plans for e3-6 and six lesson plans for e7-12) were selected for analysis. For the analysis of teacher preference in the use of the different TIM elements, pre-TIM lesson plans designed by two different teachers (“Teacher K” and “Teacher F”) were used for the analysis. The majority (five out of nine) of the pre-TIM lesson plans designed for e3-6 were designed by Teacher K. All of the pre-TIM lesson plans for e7-12 were designed by Teacher F.

In summary, the TIM team explored how the TIM could be used by first designing lesson plans for non-AE contents. This was then followed by the TIM team using the TIM for designing AE lesson plans, using the TIM in two different ways: freely and spontaneously, and deliberately. To investigate whether using the TIM changed the quality of AE lesson plans, 16 pre-TIM lesson plans were analyzed for whether there was a process pattern similar to the TIM in them and whether there was a pattern in lesson plans created by the same teacher (using TIM as a framework of analysis) and finally, comparisons were made between TIM lesson plans from Application 2 to their pre-TIM versions.

It was expected that from the analysis of the above, valuable insight could be gained in the investigation of whether and how the TIM could add value to the lesson design process in AE.

## **4. Results**

### **4.1 Application 1 Variations in the Use of the TIM**

For Application 1, two lesson plans, *Make a Pizza* (see Appendix G) and *Understanding Alphabets* (see Appendix H) were developed. The lesson plans were developed by two different groups from the TIM team and each group used the TIM in different ways: freely and spontaneously, and deliberately.

The group that designed the lesson plan *Make a Pizza* (see Appendix G) used a free flow strategy within the TIM’s three stage framework in generating the lesson plan. The group diverged on questions and activities for each stage of the lesson and went back to review

the lesson plan to label the questions and activities with the TIM teaching strategies and creativity skills. As a result, all the TIM Stage 1 teaching strategies were used, six out of the eight Stage two teaching strategies were used and three out of the five Stage 3 teaching strategies were used. In addition, 13 out of 18 creativity skills were included in the lesson plan. The lesson plan in its existing form would take a long time to deliver. It emerged from the teachers' discussion that with a divergent group of people who were used to asking their students to think and query the existing state of things, the free interaction with the TIM added to the range of ideas or activities generated for the lesson. Should there have been a time restriction on the lesson, maybe the group would have converged more on the lesson plan to reduce the activities involved.

The group that designed the lesson plan *Understanding Alphabets* (see Appendix H) first selected the TIM teaching strategies and designed activities to fit the strategies. Thus, the group created a framework matrix (the TIM stages and teaching strategies) into which teaching activities were added. In designing the activities for the lesson, the group used the creativity skills set for inspiration. In addition, the group also reported thinking up activities and labeling them with the creativity skill(s) they involved. The group purposely varied the creativity skills they used for each activity in order to give variety to the lesson. It did not occur to the group that a variety of activities could be designed even if only one or a limited number of creativity skills were used. As a result, four out of the six TIM Stage 1 teaching strategies, four out of the eight Stage 2 teaching strategies and two out of the five Stage 3 teaching strategies were used. A total of eight out of the 18 creativity skills were included in the lesson plan. In this case, the TIM enabled the group to get ideas or to enhance rudimentary ideas.

Thus, in exploring how the TIM could be used, the TIM team used the TIM in two different ways: freely and spontaneously, and deliberately.

#### **4.2 Application 2 Differences in Lessons Designed Using the TIM Spontaneously and Deliberately**

The analysis of the TIM lesson plans is provided in Appendix I. When the TIM was used freely and spontaneously as a design framework, only one TIM teaching strategy (Stage 3: *Plugging in the Sun*) and two creativity skills (*Visualize the Inside* and *Breakthrough-Extend the Boundaries*) were not used among the three TIM lesson plans. The TIM team was not given a time constraint for the lessons designed so the outcome does not indicate what can be realistically achieved in a lesson but the possibilities of what can be incorporated into the lesson plans according to the project objectives.

When the TIM team selected one creativity skill on the outset of designing a lesson and used the TIM more deliberately as a design framework, only one TIM teaching strategy (Stage 2: *Listening for Smells*) was not used in the design of three lesson plans. The TIM lesson plan *Metamorphosis* (see Appendix J) incorporated seven creativity skills instead of one as expected because the lesson plan designer thought it was 'impossible' to incorporate only one creativity skill in a lesson plan and added a further creativity skill that was not already developed in her lesson plan designed by using the TIM freely and spontaneously (Appendix K) to her attempt at using the TIM deliberately.

A closer look at the lesson plans designed using the TIM deliberately, *Dancing Fingers* (Appendix L) and *Adopt a Pet* (Appendix M) reveal simpler lesson plans than those designed using the TIM freely and spontaneously (Appendix N and O). The resulting lesson plans were more focused in content and creative thinking demanded of students.

The deliberate incorporation of only one creativity skill forced the lesson plan designer to be focused and avoid the temptation of over-diverging in a lesson's design.

In summary, the spontaneous use and deliberate use of the TIM both resulted in a high level of use of the TIM's teaching strategies but the deliberate use of TIM also enabled more focus on the development of a creativity skill within one lesson and resulted in more compact lessons.

#### 4.3 Process Pattern Similar to the TIM in Pre-TIM Lesson Plans

Table 2

An Analysis of Pre-TIM Lesson Plans

TIM Features	Frequency of Use		
	Commonly used	Frequent but not common occurrence	Not used
Stage 1 Strategies	Get Attention	Tickle the Imagination	
Stage 2 Strategies	Digging Deeper Looking Twice		Listening for Smells Crossing Out Mistakes Cutting Holes to See Through Cutting Corners Getting Out of Locked Doors
Stage 3 Strategies	Building Sand Castles		Plugging in the Sun Shaking Hands with Tomorrow
Creativity Skills	Look at It Another Way	Be Aware of Emotions Combine and Synthesize	Elaborate but Not Excessively Put Your Ideas in Context Visualize the Inside Breakthrough – Extend the Boundaries Get Glimpses of the Future

*Note.* *Commonly used* defined as strategies or skills used in more than 50% of lesson plans analyzed. *Frequent but not common occurrence* defined as strategies or skills used in more than 33% but less than 50% of lesson plans analyzed. Detailed analysis can be found in Appendix P.

Out of a total of 19 teaching strategies in the TIM, a range of three to eight strategies were used in each pre-TIM lesson plan, with an average of four strategies used. Of a total of the 18 creativity skills in the TIM, a range of two to six creativity skills were incorporated into each pre-TIM lesson plan, with an average of two creativity skills (excluding *Enjoy and Use Fantasy* and *Visualize It Richly and Colorfully* which are ‘default’ creativity skills in every AE lesson plan, see *Introduction* for discussion) incorporated in to the lesson.

It can be concluded that there was a pattern as modeled on the TIM in pre-TIM lesson plans: warm up activities were common with *Get Attention* being a common teaching strategy in Stage 1, *Digging Deeper* and *Looking Twice* were common strategies used in Stage 2 with little use of other Stage 2 teaching strategies. *Building Sandcastles* was the teaching strategy mostly used to keep students’ learning going in Stage 3, mostly in the form of asking students to keep on imagining other possibilities with their new learning. *Look at It Another Way* was the most common creativity skill designed into pre-TIM lesson plans, often as a result of the nature of the project conceptualization or description. In summary, a TIM process pattern was found in pre-TIM lesson plans but only with the inclusion of a limited range of TIM teaching strategies and creativity skills.

#### **4.4 Teacher Preferences in the Use of TIM Teaching Strategies and Creativity Skills in Pre-TIM Lesson Plans**

Given that the creativity skills of *Enjoy and Use Fantasy* and *Visualize It Richly and Colorfully* were default skills built in to each lesson plan by nature of the project conceptualization and description, they were not used to analyze individual teacher style or preference in the use of creativity skills.

Teacher K (see Appendix Q for details of analysis) appeared to have individual tendencies in the use of certain TIM teaching strategies, namely: *Getting Attention*, *Digging Deeper*, *Looking Twice* and *Building Sandcastles*. In contrast, she did not have particular tendencies in the incorporation of creativity skills in the design of lesson plans, using 12 out of 16 of the TIM creativity skills in the lesson plans analyzed with no particular preference towards any subset of skills.

Teacher F (see Appendix R for details of analysis) favored the TIM teaching strategies of *Tickle the Imagination* and *Getting in Deep Water* in designing his lessons. Teacher F also concentrated on the use of a subset of the creativity skills in his lesson plans (*Be Aware of Emotions* and *Combine and Synthesize*), having excluded the use of 10 out of 16 creativity skills. In summary, Teacher F’s lesson plans reflect an individual style or preference in lesson designs in the use of both teaching strategies and creativity skills. From the two teachers analyzed for individual preferences, there is an indication that different teachers have different preferences for developing lesson plans in terms of the use of the TIM teaching strategies and the use of the creativity skill set. The personal preferences can be for the choice of teaching strategies, creativity skills or both.

#### **4.5 Qualitative Differences Between Pre-TIM and TIM Lesson Plans**

Pre-TIM lesson plans took the following form: emphasis on TIM’s Stage 1, *Digging Deeper* and *Looking Twice* being the common TIM teaching strategies used in Stage 2 and *Building Sand Castles* often used as a teaching strategy in Stage 3. *Look at It Another Way* was a creativity skill developed in 12 out of the 16 lesson plans analyzed. An average of four creativity skills are incorporated in to each lesson plan other than *Enjoy*

*and Use fantasy* and *Visualize It Richly and Colorfully*, with *Look at It Another Way* almost being dictated at the project conceptualization level.

When compared with the results presented in the section *Application 2 Differences in Lessons Designed Using the TIM Spontaneously and Deliberately*, it appears that using the TIM freely and spontaneously as a design framework, increased the use of a variety of the TIM teaching strategies, especially in the TIM Stages 2 and 3; and that more and a wider range of creativity skills were designed into the lesson plans. However, when the TIM was used deliberately and there was a focus of one creativity skill only, TIM lesson plans still included the use of a wider variety of teaching strategies compared to pre-TIM lesson plans and due to the fact that a creativity skill was selected on the outset of designing a lesson, a focus on the development of one creativity skill ensued. The deliberate selection of creativity skills for the three TIM lesson plans resulted in the selection of two creativity skills (*Let Humor Flow – and Use It, Breakthrough – Extend the Boundaries*) that were seldom used in pre-TIM lesson plans.

In summary, TIM lesson plans incorporated more TIM teaching strategies than pre-TIM lesson plans. Furthermore, when the TIM was used spontaneously, the TIM lesson plans included more creativity skills than the pre-TIM lesson plans and the deliberate use of the TIM resulted in the inclusion of seldom used creativity skills.

## **5. Discussion**

### **5.1 Benefits in Using the TIM as a Design Framework**

Feedback from the TIM team indicated that, regardless of the way in which the TIM was used, the TIM stages acted as guidelines for design and enabled more thorough and systematic lesson planning. This resulted in more TIM teaching strategies being employed, and more creativity skills being included in lesson plans.

#### **5.1.1 Expanding variety of teaching strategies and creativity skills taught.**

Although a pattern did emerge in pre-TIM lesson plans when TIM was used as a framework of analysis, that is, a pattern that the TIM stages were followed and some TIM teaching strategies and creativity skills were incorporated into the lesson plans; as seen from Application 2 (see Appendix I and P for details of analysis), the use of the TIM as a design framework increased the use of the TIM teaching strategies and creativity skills. For example, after being introduced to the TIM, the knowledge of the TIM stages and teaching strategies acted as triggers for the TIM team to think up how to present ideas to students with the use of more of the TIM Stage 1 teaching strategies. This indicates that the TIM teaching strategies can be used to broaden the design of lessons and hence the way they are delivered. The occurrence of common TIM creativity skills in pre-TIM lesson plans could be attributed to a lack of awareness of the broad range of creativity skills set. As shown by the TIM lesson plans, being spontaneous and deliberate in the selection of creativity skills can broaden the range of creativity skills designed into the teaching process.

As many TIM teaching strategies and some creativity skills were not incorporated into pre-TIM lesson plans and the use of the TIM did broaden the range, adopting the TIM as a lesson plan design framework can enhance the quality of AE lesson plans. Furthermore, the use of the TIM was reported by the TIM team to have directed some lesson plan designers' thinking in how to maximize incubation by the activities in Stages 1 and 2. It

was suggested that the more TIM strategies are used, the more likely incubation will occur in students.

### **5.1.2 Providing focus and possibilities for convergent and divergent thinking lesson designers.**

As demonstrated in the spontaneous use of the TIM in Application 2 and from the discussions held with the TIM team, the TIM enabled the thinking up of variety in lesson plans – this may be especially helpful for users who need tools to be more fluent and flexible in the process of planning and designing lessons. The TIM teaching strategies and creativity skills set acted as a ‘menu’ from which users can use as triggers for ideas. For skilled divergent thinkers however, the list of creativity skills was said to be a temptation to include too many things into a lesson plan. It was felt that a free interaction with the TIM for skilled divergent thinkers encouraged too much divergence. As was apparent from the analysis of the free and spontaneous use of the TIM, the lesson plans (Appendix I), lesson plans can become complicated in terms of the lesson plan designer trying to “do too many things” and “putting lots of things into this” (comments from the TIM team’s debriefing sessions).

On the other hand, for skilled divergent thinkers, the deliberate use of the TIM can be and was used as a tool in dealing with or converging on a wide range of ideas, as it was used for the lesson plan *Make a Pizza* (Appendix G). The deliberate selection of the TIM teaching strategies and creativity skills on the outset of lesson design forced a focus on the lesson design. Hence, the TIM has the benefit of forcing both divergence and convergence in lesson design depending on how it is used.

## **5.2 Advantages of the Deliberate Use of the TIM**

Both the spontaneous and deliberate use of the TIM can expand a user’s repertoire of teaching strategies. However, the TIM team mentioned several advantages of using the TIM deliberately. Using the TIM deliberately resulted in more compact and focused lesson plans, helped to vary the design of the lesson plans by bypassing individual preferences and patterns and allowed a focus on one creativity skill in a lesson plan.

### **5.2.1 More compact and focused lesson plans.**

How the TIM is used during the process of lesson design seemed to affect the outcome of the lesson design process. The more deliberately the TIM is used as a lesson design framework, the more focused or compact a lesson plan occurs as a result.

As demonstrated by Application 2, the TIM can be used very loosely (evoking most or all of the strategies and creativity skills). This could be attributed to the divergent thinking nature of the TIM team, with the result that the TIM actually becomes a vehicle for users to get ‘carried away’ in the design process of a lesson. In fact, members of the TIM team did report that when the TIM was used on a free and spontaneous basis, they had the mindset of “trying to do as many things as are available”.

### **5.2.2 Overcoming project and lesson designers’ preferences.**

Using the TIM deliberately helped teachers to achieve variation in lesson plans and to step away from *how things are normally done*, preventing them from slipping into the habitual ways of designing a lesson plan and settling on the most obvious teaching possibilities.

The common use of some of the TIM teaching strategies and creativity skills could be attributed to the fact that in all AE project descriptions, creativity is described as, among other things, the ability to look at things from multiple perspectives, thus there seems to

be an inbuilt mechanism in the planning process to develop this creativity skill. As discussed in the *Introduction* section, a similar argument applies for the creativity skills of *Enjoy and Use Fantasy* and *Visualize It Richly and Colorfully*.

The incorporation of creativity skills to lesson plans was influenced by the nature of the project description, then teacher preference, more than being based on student needs or a systematic scaffolding of learning in the absence of the deliberate use of the TIM. The lesson plan *Adopt a Pet* (Appendix C) where the creativity skill *Combine and Synthesize* was written into the project description is an example of a lesson plan influenced by its project description. Teacher F's preference for the use of the creativity skills of *Be Aware of Emotions* and *Combine and Synthesize* demonstrates how a series of lesson plans can be influenced by individual preferences.

In addition, some lesson plans lend themselves to develop certain creativity skills and may not come across as lessons in which to develop the creativity skills that are less obvious possibilities. One TIM team member deliberately selected a creativity skill that did not come across as an obvious choice from the project description and selected a creativity skill that she would not have had the tendency to choose otherwise (*Dancing Fingers*, Appendix L). She reported that deliberately choosing a creativity skill in this way enabled her to push herself out of her own comfort zone.

The influence of teacher preference of creativity skills incorporated in each lesson plan is less apparent than their preference for the use of certain TIM teaching strategies. For example, Teacher F was found to have the tendency to use the Stage 1 teaching strategy of *Tickle the Imagination* and Teacher K frequently used the Stage 1 teaching strategy of *Get Attention*. Preference for some TIM Stage 2 teaching strategies resulted in five out of eight teaching strategies not being used in pre-TIM lesson plans.

We can only use or teach what we know. Thus, after the introduction of the TIM and its teaching strategies, many more TIM teaching strategies were used which indicates the value in training teachers in the TIM and its deliberate use. A similar conclusion was reached by the designers of lesson plan *Adopt a Pet* (Appendix H). Their experience in using the TIM made them realize that the TIM users may have natural preferences for creativity skills and suggested that without a more deliberate way of selecting creativity skills to develop in students, designers of lesson plans may fall prey to adhering to their preferred creativity skills in the design of lessons. A deliberate and systematic selection of creativity skills during the lesson planning stage may prevent future occurrences of the omission of a range of creativity skills, as shown by Teacher F's exclusion of the use of 10 out of 16 creativity skills in the pre-TIM lesson plans he designed (see Appendix R), and could also result in more interesting lesson plans because of unusual combinations of creativity skills and lesson contents.

The TIM team reported that it was easy to 'slip back into the old ways' of doing things even when the TIM was used as a design framework. The free and spontaneous use of the TIM facilitated users to design lesson plans as they habitually would and label the stages, teaching strategies and creativity skills accordingly with the TIM terminology. Therefore, deliberate ways of using the TIM teaching strategies and creativity skills are recommended to give results that are less subjected to a user's personal 'style' or natural tendency in how lessons are designed, and expand the possibilities afforded by the TIM in lesson design.

### **5.2.3 Systematic development of students' creative thinking.**

As teachers use the TIM deliberately, thoughtfully selecting teaching strategies and creativity skills to include in a lesson plan, students benefit in at least three ways. Students can be exposed to a wider range of teaching strategies which might help in keeping students' anticipation of learning heightened and increase incubation in learning. Secondly, students' creative thinking skills can be systematically developed over time rather than leaving it to chance or teachers' teaching preferences to have as full a set of creative thinking skills developed as possible. Lastly, the incorporation of one creativity skill into a lesson plan provides more opportunities for students to develop creativity skills more intensely ("practice makes perfect"). This last point will be discussed further below.

Using only one creativity skill for the design of a lesson plan was reported to be more fun and easier than incorporating several creativity skills. It was also thought that incorporating only one creativity skill into a lesson would allow students more intensive practice of one skill, in turn enabling students to be more aware of the creativity skill being developed in them, thus raising students' meta-cognition of their learning. However, it was questioned whether it is possible to incorporate only one creativity skill into a lesson plan. This arose from the observation that lesson plans designed by deliberately incorporating one creativity skill only would inevitably incorporate other creativity skills as the lesson plan was developed. One TIM team member opined that she found it hard to incorporate one creativity skill to the exclusion of other creativity skills. Other TIM team members approached the design of lesson plans that incorporates only one creativity skill by using the selected skill as the focus for the design of the lesson plan. Their view was that the resulting lesson plans may have included the development of other creativity skills as well but they were not the *cause* of the design of the lesson plan but rather the *effects*. Whilst it is certainly the case that lessons cannot incorporate one creativity skill to the exclusion of others, the focus on a particular creativity skill during the design stage of a lesson ensures that the selected creativity skill will be woven throughout a whole lesson and thus strengthens the development of that particular creativity skill in students during a lesson.

Lastly, the TIM team suggested that if a lesson plan was only to have one creativity skill as a focus, it was important that the creativity skill in question is addressed or designed into each of the three stages of the TIM to ensure its development in students during the delivery of a lesson. A design strategy used by one group of the TIM team (Appendix M) was to ask at the design of the lesson at each stage of the TIM, "how can we incorporate the creativity skill we selected at this stage?"

In summary, deliberately selecting TIM teaching strategies can help heighten incubation in student learning and deliberately selecting creativity skills for each lesson ensures the systematic development of a wide range of creativity skills over time and provides opportunities for students to practice using the creativity skills more intensely.

### **5.3 Preparing Teachers to Use the TIM**

#### **5.3.1 Emphasis on teaching strategies and creativity skills set.**

Training on the TIM should focus on both the TIM teaching strategies and creativity skills to enhance the use of both in designing lesson plans. The TIM team suggested that the TIM teaching strategies were the strength of the TIM and that it is the use of the TIM teaching strategies that encourage thinking and hence incubation in students. It was also suggested that the more TIM strategies are used, the more likely incubation will occur.

### **5.3.2 Need to experiment with the TIM.**

Knowing the TIM is insufficient for its effective use. Users need to experience the various ways of using the TIM as a design framework especially in light of the fact that when the TIM is used in different ways, it yields substantially different results in lesson plans, it is important that students of the TIM experiment with its use. It is therefore recommended in training to have students of the TIM deliberately use the TIM in different ways (free interaction, the TIM as a deliberate framework, multiple skills development, single skill development etc.) to experience how the TIM can give different results when used differently.

Since Torrance & Safter (1990) did not give guidelines in how the TIM should be used (e.g How to select strategies? How to select creativity skills? Are there optimal mixes of strategies and creativity skills? Is there an optimal way in building the creativity skills set?). The effectiveness in the use of the TIM is dependent upon the experience and insight of the instructor of the TIM and the end users of the TIM to understand how individual thinking styles and preferences in addition to the various ways of using the TIM as a framework for designing lessons can affect the outcome.

### **5.3.3 Understanding individual preferences and the use of the TIM.**

For more divergent minded teachers, the TIM can be used as a convergent tool for the design of lesson plans and vice versa for more convergent-minded teachers. Teachers may also have preferences for teaching strategies and creativity skills. An awareness and understanding of one's personal thinking style and one's preferences in teaching strategies and creativity skills will enable one to be in control when using the TIM and optimizing the possibilities it affords.

## **6. Weaknesses and Limitations of Study**

The study of the TIM was conducted for lessons designed as extra-curricular lessons and due to the specific nature of the project objectives, the TIM may apply differently in different educational settings. As the TIM team were trained to teach creative thinking to children, their use of the TIM may also have been influenced by their prior training and the results and conclusions drawn from this study must be read with this in mind.

## **7. Further Investigation**

Torrance and Safter (1990) wrote that information about the hierarchy of creative skills was essential so that teachers would be "aware of the kinds of creative thinking skills that could be expected at different educational levels". Although the need for such a hierarchy was recognized, the formulation of the TIM did not seem to have addressed this aspect of the creative thinking skills set. It would be informative to investigate the relationships (if any) among the creativity skills, that is, whether there is a basic level of skills that feed into more complex creativity skills leading to a refined model that might include how the creativity skills could be scaffolded in learning.

Futhermore, investigation into how prior experiences in lesson design might influence the use of the TIM and the outcome of its use may be useful for designing instructions to prepare teachers to use the TIM. As the TIM was designed to enhance incubation and to deliberately develop creative thinking skills, the TIM could be further refined by the addition of teaching strategies and other creativity skills uncovered by research.

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## Appendix A

### An Overview of the Torrance Incubation Model

The TIM has 3 distinct features:

1. **3 stages of teaching:**
  - i. **Heighten Anticipation** – getting students interested in what is to follow.
  - ii. **Deepening Expectations** – deepening the learning of the contents by students.
  - iii. **Keeping It Going** – keeping students thinking about what has been learnt.
2. Suggested **teaching strategies** at each stage of teaching (***Stage 1 Heighten Anticipation:*** Create the Desire to Know, Heighten Anticipation and Expectation, Get Attention, Arouse Curiosity, Tickle the Imagination, Give Purpose and Motivation; ***Stage 2 Deepening Expectations:*** Digging Deeper, Looking Twice, Listening for Smells, Crossing Out Mistakes, Cutting Holes to See Through, Cutting Corners, Getting in Deep Water, Getting Out of Locked Doors; ***Stage 3 Keeping It Going:*** Having a Ball, Singing in One's Own Key, Building Sand Castles, Plugging in the Sun, Shaking Hands with Tomorrow.)
3. **Creativity Skills Set (Creative Thinking Skills)**

Apart from teaching the subject or contents of the lesson, the TIM also requires creative thinking skills to be taught to students by way of designing activities during a lesson that develop those creative thinking skills. The TIM creative thinking skills set includes 18 creative thinking skills, although Torrance made it clear that this is by no means an exhaustive list (Torrance & Safter, 1999).

The 18 creative thinking skills are the results of many years of research led by Torrance (Torrance, 1979; Torrance & Safter, 1999). The creative thinking skills include: defining the problem, produce and consider many alternatives, be flexible, be original, highlight the essence, elaborate – but not excessively, keep open, be aware of emotions, put ideas in context, combine and synthesize, visualize it – richly and colorfully, enjoy and use fantasy, make it swing! make it ring!, look at it another way, visualize the inside, breakthrough – expand the boundaries, let humor flow and use it, and get glimpses of the future.

### The Creativity Skills

#### **The Problem**

The recognition or awareness of a problem, the definition of a problem and commitment to deal with it. This involves the ability to break a problem down to sub-problems and looking at different aspects of a problem.

#### **Produce and Consider Many Alternatives**

The ability to generate many ideas or having a flow of ideas.

#### **Be Flexible**

The ability to generate a variety of ideas (ideas that belong to different categories), perceive problems from various angles, and mentally breaking out from old ways of doing things to do things differently.

#### **Be Original**

The ability to look at problems or generate ideas that are uncommon and unlikely to be thought of by others.

**Highlight the Essence**

The ability to ‘get to the heart’ of a problem or an idea. This includes the ability to sift through a mass of information to locate what is relevant, discarding unpromising information and refining ideas to allow a single problem or idea to emerge as the dominant problem or idea.

**Elaborate – but Not Excessively**

The ability to develop or elaborate on an idea for its possible implementation, but only if the elaboration adds value or contributes constructively to the development of the idea.

**Keep Open**

The ability to resist the urge to ‘jump to conclusion’ or to complete things as quickly or easily as possible.

**Be Aware of Emotions**

The ability to tap into ones and others’ feelings to ‘read’ and understand problems or to generate ideas

**Put Your Ideas in Context**

The ability to put things together in meaningful ways by giving them a history, background or story; or placing problems or ideas into their wider context to see how things fit or ‘hang’ together

**Combine and Synthesize**

The ability to make fresh and relevant association of thoughts, facts or ideas into new combinations that result in an outcome that is more meaningful than the sum of the parts on their own.

**Visualize It – Richly and Colorfully**

The ability to create rich, colorful and exciting imagery that appeal to all five senses.

**Enjoy and Use Fantasy**

The ability to imagine and think about things that do not yet exist.

**Make It Swing - Make it ring!**

The ability to use kinesthetic (movement) and auditory senses and responding to sound and movement.

**Look At It Another Way**

The ability to see things in different visual perspectives and to look at things from different points of views.

**Visualize the Inside**

The ability to see the ‘inside’ of things or taking an internal perspective. This involves seeing beyond the outside of things and paying attention to their internal, dynamic workings.

**Breakthrough – Extend the Boundaries**

The ability to break away from existing ways of thinking or seeing things, challenging the underlying assumptions of situations, problems or ideas.

**Let Humor Flow - and Use It**

The ability to generate and respond to unusual combinations, surprise and conceptual or perceptual incongruities and to laugh at oneself and events in life while at the same time remaining in contact with people and events in a positive way.

**Get Glimpses of the Future**

The ability to have a vision of one's future, to imagine and explore things that do not yet exist, and dreaming and wondering about possibilities.

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Appendix B

Sample of An Art Explore Project Description

PROJECT OBJECTIVES		For Dewi		For Teachers	
Name		Idea generation method for e6-12: * for e4-12	Forced connections - random words/ things*	New materials?	yes --> introduce & explore
Class	E3-6 October Week 3		Brainwriting (passing paper)*		no X
Project	Ace of Dice 2		Visual connections - random pictures*	New technique/ tool?	yes --> introduce & explore X
<b>Creative Objectives</b>			Scamper (with brainstorming)*		no
	Desire change and improvement		Idea box	Order of Creative Process	knowledge base 3
	See a situation from a new perspective		Mindmapping/ brainstorming*		exploration 2
	Be willing to consider unusual or absurd ideas		Excursions*		(discussion) 4
	Take action to make improvements	Planning	Sketch		decision making 1
<b>Artistic Objectives</b>			Bubble diagram		idea generation 5
	Creation of collage that starts with a circle		Sequencing		reflection 6
<b>Knowledge Base</b>			Compare & contrast diagram	Multiple Intelligences	Natural X
	Variety of collage		Comic strip	(use at least 3)	Bodily/ kinesthetic
<b>Imagination Base</b>			Mindmapping	for knowledge base,	Linguistic
	What can we do to paper? What can we turn a circle into?	Project level	Individual	exploration or idea generation)	Logical/ mathematical X
<b>Multiple Intelligences Focus</b>			Pair		Visual/ spatial X
	Visual, mathematical/logical		Group		Rhythm/ Musical
<b>Description</b>			Community		Interpersonal X
Students cut the circles created from colored A4 pages from the previous week. We give students a variety of papers (color magazine, crepe, oil, matte and reflective origami, construction papers, etc.) and ask them to explore different ways to treat the materials. We then introduce students to collage and ask them to observe how the papers were treated to create the collage. They are then asked to use one of the cut out circles to start a collage. They can add other paper cut outs. When they are done, they will be challenged to create another collage using two circles, and so on until they start a collage using 6 circles.					Intrapersonal
<b>Suggested Activities</b>		<b>Note</b>			
Keep thinking about what you can turn a circle into!		Keep products from this lesson for week 3! This lesson is part 2 of 3 (or possibly 4) lessons. Carla: look for other project descriptions to avoid overlapping. These lesson plans are adapted from current Springfield lesson plans on circles to try compare with the result from Springfield. Feel free to add/ modify/ review from Springfield lesson plans.			

## Appendix C

### The TIM Team Training Outline

Table 1 The TIM Training Outline

Session	Contents	Activities
Session 1	Creativity Skills Set	Participants were assigned two or more creativity skills from the TIM creativity skills set and were asked to design activities that developed those skills. Participants facilitated the activities during workshops from which other participants had to guess which creativity skill was being developed. A debriefing was conducted to discuss the activity, how it related to the skill and how the activity could have been strengthened in terms of the skill it was trying to develop.
Session 2	Creativity Skills Set  Introduction to TIM	Continuation of session 1  After reading materials on the TIM, participants were asked to 'reconstruct' the TIM based on what they remembered from their readings. Discussions followed to ensure a clear understanding of the model.
Session 3	TIM Application 1: Familiarization	Participants were asked to choose contents of their choice (of which they should be familiar) and use the TIM as a framework to design a lesson plan. The resulting lesson plans were shared and discussed. Personal reactions to the design activity using the TIM were also shared.  (See Appendix B for lesson plans)
Session 4	TIM Application 2:	Participants were asked to select a project from

	Digging Deeper	<p>the AE Creativity Program and design two lesson plans using the TIM in the following ways:</p> <ol style="list-style-type: none"> <li>1. Interact with the TIM freely and spontaneously.</li> <li>2. Select one creativity skill from the skill set and deliberately use the stages and strategies of the TIM to incorporate the creativity skill in addition to other contents as specified in the project description.</li> </ol> <p>(See Appendix C for lesson plans)</p>
Session 5	TIM Application Debriefing	<p>Lesson plans were presented by participants followed by personal reactions to the two different ways of using the TIM.</p> <p>The following was discussed to conclude the training:</p> <ol style="list-style-type: none"> <li>1. What are the strengths of the TIM?</li> <li>2. What do we like about the TIM?</li> <li>3. Which aspects of the TIM do we want to adopt?</li> <li>4. How to proceed with the TIM in AE?</li> </ol>

## Appendix D

### Project Objectives and Pre-TIM Lesson Plan - Metamorphosis

<b>PROJECT OBJECTIVES</b>	
Name	
Class	<u>E6-8 FE34</u>
Project	Metamorphosis
<b>Creative Objectives</b>	
■	Desire change and improvement
■	See a situation from a new perspective
■	Be willing to consider unusual or absurd ideas
■	Take action to make improvements
<b>Artistic Objectives</b>	
	Comic strip and how it could represent changes Transforming comic strip into 3D clay models
<b>Knowledge Base</b>	
	Metamorphosis
<b>Imagination Base</b>	
	What other things can be inspired by metamorphosis?
<b>Multiple Intelligences Focus</b>	
	Naturalist, Visual/ spatial, Logic & Math
<b>Description</b>	
We give students knowledge base about metamorphosis in a life of a butterfly, focusing how it changes form, and how its life (what it does) is different in every stages. Students are asked to pick something simple that they like (e.g. a toy, stuff animal, etc.) and ask them what they would want it to do for them. Students are challenged to come up with 3 functions. Students are introduced to comic strip and how it could represent changes. They are challenged to create a comic of the original thing, then how it would transform into 3 other forms that would represent the 3 functions they selected earlier. [In the second week, they are asked to transform their ideas into 3D clay models → omitted from lesson plan]	
<b>Suggested Activities</b>	
Explore what other things can be inspired by metamorphosis.	

**Note:**

e6-8: ask students to bring their favorite thing (e.g. toy, stuff animal, etc.) to class in the previous week's lesson.

Picture of metamorphosis:

- Pustaka Alam Life "Serangga" p. 57; 64-5
- Childcraft "About Animals" p. 88-9

**Lesson Structure**

Time	Activity	Materials
Special Equipments & Props	Pustaka Alam LIFE "Serangga", A5 paper, Color pencil, Visuals of comic strip, Visuals of metamorphosis from box to circle	
15 mins	Discussion: <ul style="list-style-type: none"> <li>- What process of metamorphosis that ever crossed your mind?</li> <li>- Discuss the "Serangga" book (p. 57; 64-5). Provide print outs.</li> <li>- Show Batman VCD or any that shows the metamorph.</li> <li>- Show photocopied outline of shapes that shows metamorphosis.</li> <li>- Provide the box filled with outlined shape of objects.</li> <li>- Ask students to take 2 papers out of the box.</li> </ul>	<ul style="list-style-type: none"> <li>- Visual print outs</li> <li>- Batman VCD</li> <li>- VCD player</li> <li>- Box of shapes</li> </ul>
60 mins	Activity: <ul style="list-style-type: none"> <li>- Provide students with acetates to create the draft visuals of the metamorphosis from their chosen objects.</li> <li>- Ask students to create their metamorphosis thru comic strips (showing visuals of comic strips) and using color pencils.</li> <li>- Create minimum 4 stages.</li> </ul>	<ul style="list-style-type: none"> <li>- Pustaka Alam "Serangga" book</li> <li>- Color Pencil</li> <li>- A5 BC paper</li> </ul>

10 Mins	<p>Ask students to sketch the before of their first objects and the after of their second objects each on a separate paper.</p> <p>For the 2<sup>nd</sup> week, ask them to create the 3D version of the 1<sup>st</sup> week project with minimum 4 stages.</p>	<p>For the 2<sup>nd</sup> week:</p> <ul style="list-style-type: none"><li>- Clay</li><li>- Sticks</li><li>- Wires</li><li>- <a href="#">Impra boards</a></li></ul>
5 mins	Wrap up & Clean up	

## Appendix E

### Project Objectives and Pre-TIM Lesson Plan – Dancing Fingers

PROJECT OBJECTIVES		
Name		
Class	E3-6 January Week 2	
Project	Dancing Fingers	
Creative Objectives		
■	Desire change and improvement	
■	See a situation from a new perspective	
■	Be willing to consider unusual or absurd ideas	
■	Take action to make improvements	
Artistic Objectives		
	How movements can be tracked and what kind of patterns they could create. e4-6: Introduction to pattern as repeated things.	
Knowledge Base		
	Different movements of animals	
Imagination Base		
	What could the patterns look like?	
Multiple Intelligences Focus		
	Visual/ spatial, bodily kinesthetic, natural	
Description		
<p>We explore with students how animals walk differently (e.g. human walks with two feet, crab walks sideways, snake crawls, etc.) and try this using our bodies, then using our hands only. Then we will track the different movements using painted fingers. Afterwards, we ask students to link the dots using oil pastel to create pattern, and discuss with students what kind of patterns they fingers have created. Students then explore different type of movements their fingers could create and observe the different tracks being created. They could also create more patterns by linking (drawing lines to connect) the painted dots/ lines. Inspired by their explorations, students in e4-6 can create a story or a picture.</p>		
Suggested Activities		
Explore movements of animals using our elbows or other parts of the body on sand/ using paint and observe the different patterns.		
Time	Lesson	Material
15	Introduction: <ol style="list-style-type: none"> <li>1. What animals do you know that is moving? How do they move?</li> <li>2. I have some animals here. Let's how they move together! (for e34: start from watching the animal).</li> <li>3. (Put the animals on the table one by one. (animals=crab, snail, lobster, hermitcrab, Centipede, Worm)</li> <li>4. (for e34: can use toys instead of animals like the winding thing and the walking sushi). Ask the students to follow how the animals move)</li> </ol>	Animals: snail, lobster, hermitcrab, centipede, worm, crab  toys: the winding thing and the walking sushi  Assorted A4 asturo paper 5/students

40	<p>Imagination:</p> <ol style="list-style-type: none"> <li>5. (provide assorted colors of A4 asturo paper and red poster color on the table).</li> <li>6. Try each of walking mode you found by using your finger on a (any color) of the paper.</li> <li>7. (Repeat this activity for another two walking mode).</li> <li>8. Take a look to your repeated dots! What do you think these dots remind you of? (Pattern=repetition of things).</li> <li>9. (for e34: if there is still time, they can do the activity but using their other body parts to create the pattern)</li> <li>10. Can you create a story of these patterns?</li> <li>11. Arrange your pattern according to your story! Use pencil to draw another pattern by connecting the dots to complement your story.</li> </ol>	
5	Clean-up	

## Appendix F

### Project Objectives and Pre-TIM Lesson Plan – Adopt a Pet

PROJECT OBJECTIVES	
Week	NV 2
Class	E3-6
Project	Adopt a Pet
<b>Creative Objectives</b>	
■	Desire change and improvement
■	See a situation from new perspectives
■	Be willing to consider unusual or absurd ideas
■	Take action to make improvements
<b>Knowledge Base</b>	
	Pet: why do we have pet, what can we do with them, etc.
<b>Artistic Objectives</b>	
	Create your imaginary pet using clay
<b>Imagination Base</b>	
	If we have our favorite food or fruit as our pets, what do we want to do with it?
<b>Multiple Intelligences Focus</b>	
	Linguistic, Spatial/ Visual
<b>Description</b>	
We discuss with students what they know about a pet, what does it mean to have a pet, what would they want to do with a pet, etc. We introduce students to Silverstein's poems "Wild Strawberries" (e4-6) and "Hot Dog" (e3-4). We then ask students what food or fruits they like, and imagine if the food or fruits become our pets, what would happen? What could we do with them? What do we want them to do? What would happen to the pets? Students to create representation of their pets using clay.	
<b>Suggested Activities</b>	
Adopt other unusual things as a pet, imagine what could happen, and draw them.	

See "A Light in the Attic" by Silverstein, p. 66 & 69

Hot Dog

I have a hot dog for a pet,  
 The only kind my folks would let  
 Me get.  
 He does smell sort of bad  
 And yet,  
 He absolutely never gets  
 The sofa wet.  
 We have a butcher for a vet,  
 The strangest vet you ever met.  
 Guess we're the weirdest family yet,  
 To have a hot dog for a pet.

Time	Activity	Materials
Special Equipments & Props	Clay, A4 BC paper, marker, oil pastel, 40X40 impraboard	
25 mins	For e46: 12. Do you have pet? Why you like pet? What is your pet? 13. (if most of their pets are animals ask them why pet must be animal? If not, ask them what is a pet than?) 14. If all of your wishes can really happen, what pet do you want to have? (ask them to do their own brainstorming on a A4 HVS paper) 15. What do you want to do with the pet?	A4 BC paper oil pastel marker

	<p>16. Now take a look to a white board (paste the hot dog poem to white board). Read the poem together!</p> <p>17. What do you think this poem is trying to tell you?</p> <p>18. (provide them with another A4 HVS paper)</p> <p>19. so If fruits or foods can be your pet, what is your favorite fruits/foods that you want to be your pet? (do another brainstorming on the paper)</p> <p>20. Put the two papers you had in front of you on the table. (if it is possible, tape the two papers together).</p> <p>21. Now look to your two papers! I want you create a pet (3D) by combining an object from your pet dream pet and fruit paper.</p> <p>For e34:</p> <ol style="list-style-type: none"> <li>1. Read the poem! What do you think the poem is trying to tell?</li> <li>2. do you have pet? Why you like pet? What is your pet?</li> <li>3. What is your dream pet? What do you want to do with your dream pet?</li> <li>4. Now lets talk about your favorite food or fruit. What is your favorite food or fruit.</li> <li>5. If you can turn your food or fruit to be your pet, what do you want it looks like?</li> </ol>	
30 mins	1. Build your pet out of clay!	Impraboard 40X40 clay
5 mins	Wrap up & Clean up	

## Appendix G

### Application 1 Lesson Plan – Make a Pizza

#### Assumptions:

Class size: 10 students

Student age: 8 yrs

**Objective:** Students understand process of making pizza

Activities	Strategies / Skills
<p>Stage 1: Introduction</p> <ul style="list-style-type: none"> <li>- students' eyes being covered</li> <li>- bring in warm pizza</li> <li>- ask them to guess what it is</li> <li>- slice and give them bits to taste</li> <li>- guess (pizzas) ingredients</li> <li>- imagine what it looks like</li> <li>- open their eyes</li> <li>- do you know where pizza comes from?</li> <li>- Give them knowledge base re: origin of pizza</li> <li>- What do you think pizza is made of?</li> <li>- How to make it?</li> <li>- What equipment?</li> <li>- What else (ingredients) would go with pizza?</li> <li>- What shape is pizza?</li> <li>- What other shape can it be?</li> </ul>	<p>Heighten curiosity Heighten curiosity Heighten curiosity / desire to know</p> <p>Desire to know Tickle imagination</p> <p>give purpose and motivation give purpose and motivation desire to know arouse curiosity arouse curiosity arouse curiosity</p> <p>skills: be flexible, use fantasy, use humour, produce and consider alternatives</p>
<p>Stage 2: Activity</p> <ul style="list-style-type: none"> <li>- we will make pizza today</li> <li>- I want you to look for pizza recipe to find ingredients, what equipment you need, how to make the pizza.</li> <li>- From all the recipes, what makes pizza a pizza?</li> <li>- Give them pizza (different toppings) to taste: what do / don't you like?</li> <li>- So what kind of pizza you want to make?</li> <li>- What shape you want to make?</li> <li>- What do you need to do to change ingredients to pizza? Where to get ingredients? What can you do? How to look (what equipment)? How to serve?</li> <li>- Elaborate each step</li> <li>- Make the pizza</li> <li>- Clean up</li> </ul>	<p>Diggin deeper</p> <p>Skill: highlight the essence</p> <p>Crossing out mistakes</p> <p>Targeting and focusing Skill: be original Looking twice Skills: highlight the essence, combine and synthesize</p> <p>Getting in deep water / getting out of locked doors Getting in deep water Skills: elaborate but not excessively, put your ideas into context, visualize richly</p>
<p>Stage 3: Week 2</p> <ul style="list-style-type: none"> <li>- refer back to origin of pizza</li> <li>- we will make an Indonesian pizza</li> <li>- what are the typical Indonesian food? What are the ingredients?</li> <li>- What ingredients would you use for your Indonesian pizza?</li> <li>- Once you find the mixture, what occasion would you want to use the pizza for?</li> <li>- What shape, color,? Combination of taste? Try / explore.</li> <li>- How would that change the pizza?</li> </ul>	<p>Having a ball. Skill: let humour flow Singing in one's key</p> <p>Skills: be flexible, keep open</p> <p>Skill: visualize richly and colourfully</p> <p>Building sancastle Plugging in the sun</p>

<ul style="list-style-type: none"><li>- How would you present it?</li><li>- What would you name it? Where to sell? How?</li></ul>	Shaking hands with tomorrow Shaking hands with tomorrow Skills: enjoy and use fantasy, getting glimpse of the future
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## Appendix H

## Application 1 Lesson Plan – Understanding Alphabets

## Understanding Alphabets

Strategy	Stage 1 Heightening Anticipation	Stage 2 Deepening Expectations	Stage 3 Keeping it going
Tickle the imagination & Get attention	Enjoy and use fantasy: Imagine how people communicate without sound and words? (you are trapped in a big drum of evil coffee beans). 2. Now try to communicate with words?. 3. Compare the different.		
Give purpose and motivation	Highlight essence: You need words to communicate, you need to learn about words.		
Arouse curiosity	Look at it the other way: In what ways you can use words in the previous situations when it was impossible to speak		
Give purpose and motivation	You need to learn ABC to communicate		
Digging Deeper		What is the ABC?, How to arrange ABC, How to use ABC? <b>Make it Swing, Make It Ring</b> : Sing the ABCs; <b>Combine and synthesize</b> , : Pick a letter and make a word	
Looking twice		Talk about different languages	
Getting out of Locked doors		<b>Be Flexible</b> : creating your own words and their meaning	
Cutting holes to see through		Categorize non sensible vs sensible words	
Building Sandcastles, Having a ball			<b>Be Original</b> : Turn the alphabet into new fonts/shape/something
Shaking hand with tomorrow			<b>Get a glimpse of the future</b> : Create another language
Closings			Teacher shake hands with students while students present the new font and new language. Literally shaking hand with tomorrow



## Appendix J

### Application 2 Deliberate Use of the TIM Lesson Plan - Metamorphosis

Lesson Plan #1: TIM Application

Activities	Strategy	Skill
<b>I. Heightening Anticipation</b> Introduction <ul style="list-style-type: none"> <li>- show students Spongebob Squarepants “Wormy” [5 min clip]</li> <li>- what happened with wormy?</li> <li>- what did Spongebob has instead of wormy? [butterfly]</li> <li>- why did Spongebob has a butterfly instead of wormy?</li> </ul>	Get attention	The problem
Knowledge Base <ul style="list-style-type: none"> <li>- do you know about the relation between butterfly and worm?</li> <li>- [yes] what do we call the changes in life of a butterfly? [metamorphosis]</li> <li>- [no] do you know about the word metamorphosis?</li> <li>- what do you know about it? → discuss and expand by giving students knowledge base about the complete cycle in life of a butterfly and how its life (what it does) is different in every stages</li> <li>- what shape is it in each different stages?</li> </ul>	Arouse curiosity Create the desire to know	Highlight the essence
<ul style="list-style-type: none"> <li>- why do you think butterfly need to be worm first?</li> <li>- do you think it has to come from worm?</li> <li>- what do you think would happen if butterfly comes from ant? or a pencil?</li> </ul>	Heighten anticipation and expectation Tickle the imagination	Enjoy and use fantasy
Activity <ul style="list-style-type: none"> <li>- do you have a pet or a toy that you like very much?</li> <li>- what is it?</li> <li>- what can it do for you?</li> <li>- what would you like it to do for you?</li> <li>- I want you to think about 3 new functions you want your pet/ toy to do for you.</li> <li>- imagine that you experience Spongebob’s experience: your pet/ toy change to something else so it could do the three things you want it to do. what do you think your pet/ toy need so it can perform these functions?</li> <li>- how can you tell other people that your pet/ toy now can do these three new functions?</li> <li>- we will learn about one way of communicating this: the comic strip.</li> </ul>	Give purpose and motivation	Produce and consider many alternatives
<b>II. Deepening Expectations</b> <ul style="list-style-type: none"> <li>- draw a picture of your pet/ toy now in the middle of the A3 page</li> <li>- write down the 3 new functions you want your pet/ toy do for you [use bubble diagram/ mind map].</li> <li>- from each function, write down 5 different things that you know of that have this function [e.g. flying → parachute, airplane, balloon, rocket, wing].</li> <li>- on the side of each writing, I want you to draw a sketch of the thing.</li> </ul>	Digging deeper Looking twice	Produce and consider many alternatives
<ul style="list-style-type: none"> <li>- now look at all the options you have to improve on your pet/ toy.</li> <li>- which ones do you like?</li> <li>- which ones don’t you like?</li> <li>- how can you improve upon them? can you combine them?</li> <li>- after you decide on how your pet/ toy can have each new function in what form, I want you to draw it.</li> </ul>	Crossing out mistakes Getting in deep water Cutting corners	Combine and synthesize
Activity <ul style="list-style-type: none"> <li>- now we will start making sketches for your comic strip.</li> <li>- [show sketches done by comic artists to create a comic strip]</li> <li>- on the first page, I want you to draw your pet/ toy.</li> <li>- on the second page [may want to use acetate], I want you to explore ways how your pet/ toy can have its new function. think about the color. is it hard/ soft? is it detachable or not? can it expand? can</li> </ul>	Getting in deep water Getting out of locked doors	Visualize it – richly and colorfully

<p>you hide it?</p> <ul style="list-style-type: none"> <li>- on the third page, do the same for second function</li> <li>- on the fourth page, do the same for third function</li> <li>- can you combine the three functions or would you rather they are separate? can one function transform into another? you can play around with the acetate.</li> </ul>		
<p><b>III. Keeping It Going</b></p> <ul style="list-style-type: none"> <li>- show students comic strips. what does a comic strip have? [pictures, story line, sometime words]</li> <li>- now what do you need to think about to prepare making your comic strip? [story line]</li> <li>- what kind of story lines you know? which one is your favorite? why? where did it happen? what happened? how did it end?</li> <li>- so now you will need to think about storyline. where does it happen? your house? your yard? your school? your stomach? the jungle? the sky? outer world? underwater? toilet bowl?</li> <li>- what happened? you may want to take two things at a time: come up with a story how your pet/ toy would use one of the three functions. think about how your pet/ toy would relate/ play with you with this new function: would you want it to do things for you? are you part of the story? how? would it get into trouble because of the new function? if so, what kind of trouble? how would it get out of it? how did your pet/ toy get into your stomach? or inside the toilet bowl? what must it do to get out of it? or where would it go from there?</li> <li>- what would happen next? how would your pet/ toy use its two other functions? does your pet/ toy know how to use them all? is it clumsy/ savvy? what would happen if one of the functions do not work as intended and it's emergency?</li> <li>- how would the story end?</li> </ul>	<p>Having a ball</p> <p>Singing in one's key</p> <p>Building sandcastles</p>	<p>Highlight the essence</p> <p>Elaborate – but not excessively</p> <p>Put your ideas in context</p>
<ul style="list-style-type: none"> <li>- once you have your story line, you can start making your comic strip.</li> <li>- how can you put all the information [where, what happened, how did it end] in your comic strip? will it be through drawings or words or combination of both?</li> <li>- you can look for references for your drawings in the library and use different medias: color pencils, color markers [of different thicknesses] → assume that this has been explored in previous lesson.</li> <li>- how many strips do you need to create your story?</li> </ul>	<p>Plugging in the sun</p>	<p>Elaborate – but not excessively</p>
<ul style="list-style-type: none"> <li>- could you have made your comic strip with only words or drawings? why?</li> <li>- could you have made your comic strip and communicate the story in just 4 boxes?</li> <li>- would you want to be a comic artist? why?</li> <li>- if yes, what do you need to do to make your comic better?</li> </ul>	<p>Shaking hands with tomorrow</p>	<p>Look at it another way</p>

## Appendix K

## Application 2 Spontaneous Use of the TIM Lesson Plan - Metamorphosis

Lesson Plan #2: TIM Application with one skill: Breakthrough – extend the boundaries

Activities	Strategy
<p><b>I. Heightening Anticipation</b></p> <p>Introduction</p> <ul style="list-style-type: none"> <li>- show students Spongebob Squarepants “Wormy” [5 min clip]</li> <li>- what happened with wormy?</li> <li>- what did Spongebob has instead of wormy? [butterfly]</li> <li>- <i>so what do you think is the problem? how could the problem be avoided?</i></li> <li>- <i>what other things could Spongebob find instead of wormy? how would this change the story?</i></li> <li>- why did Spongebob has a butterfly instead of wormy?</li> <li>- <i>what other things could Spongebob find instead of a butterfly? how would this change the story?</i></li> </ul>	Get attention
<p>Knowledge Base</p> <ul style="list-style-type: none"> <li>- do you know about the relation between butterfly and worm?</li> <li>- [yes] what do we call the changes in life of a butterfly? [metamorphosis]</li> <li>- [no] do you know about the word metamorphosis?</li> <li>- what do you know about it? → discuss and expand by giving students knowledge base about the complete cycle in life of a butterfly and how its life (what it does) is different in every stages</li> <li>- what shape is it in each different stages? <i>what other things have this shape? how can this inform different things each stage could be about?</i></li> <li>- <i>what do you think could happen before and after the stages in the life of a butterfly?</i></li> </ul>	Arouse curiosity Create the desire to know
<ul style="list-style-type: none"> <li>- why do you think butterfly need to be worm first?</li> <li>- do you think it has to come from worm?</li> <li>- what do you think would happen if butterfly comes from ant? or a pencil? <i>would it change the shape in different stages? would it change what each stages is about (what it does)? how many stages could it have instead of four?</i></li> </ul>	Heighten anticipation and expectation Tickle the imagination
<p>Activity</p> <ul style="list-style-type: none"> <li>- do you have a pet or a toy that you like very much?</li> <li>- what is it?</li> <li>- what can it do for you?</li> <li>- what would you like it to do for you? <i>what would it want to do for itself? what does it dream about? what does it wish for? come up with 10 alternatives</i></li> <li>- <i>I want you to pick 4 new functions: 2 from what you want your pet/ toy to do for you, and 2 from what your pet/ toy may want</i></li> <li>- imagine that you experience Spongebob’s experience: your pet/ toy change to something else so it could do the four things you want it to do. what do you think your pet/ toy need so it can perform these functions?</li> <li>- how can you tell other people that your pet/ toy now can do these three new functions? <i>brainstorming first, then: come up with other ways you don’t normally use.</i></li> <li>- we will learn about one way of communicating this: the comic strip. <i>but remember of these other ways we can use.</i></li> </ul>	Give purpose and motivation
<p><b>II. Deepening Expectations</b></p> <ul style="list-style-type: none"> <li>- draw a picture of your pet/ toy now in the middle of the A3 page</li> <li>- write down the 4 new functions you want your pet/ toy do for you [use bubble diagram/ mind map].</li> <li>- from each function, write down 5 different things that you know of that have this function [e.g. flying → parachute, airplane, balloon, rocket, wing]. <i>then add other ways you won’t normally relate with flying, and think about how they can fly [e.g. throw, bounce, make it light, blow, etc.]</i></li> <li>- on the side of each writing, I want you to draw a sketch of the thing.</li> </ul>	Digging deeper Looking twice
<ul style="list-style-type: none"> <li>- now look at all the options you have to improve on your pet/ toy.</li> <li>- which ones do you like? <i>how can you turn it into something you don’t like?</i></li> <li>- which ones don’t you like? <i>how can you turn it into something you like?</i></li> <li>- <del>how can you improve upon them?</del>—can you combine them?</li> <li>- after you decide on how your pet/ toy can have each new function in what form, I want you to draw it. <i>I want you to create form you won’t normally think/ make.</i></li> </ul>	Crossing out mistakes Getting in deep water Cutting corners
<p>Activity</p> <ul style="list-style-type: none"> <li>- now we will start making sketches for your comic strip.</li> <li>- [show sketches done by comic artists to create a comic strip]</li> <li>- on the first page, I want you to draw your pet/ toy. <i>I want you to add 5 different angles and cover the 6 angles: view from top, bottom, front, back, left side, and right side.</i></li> </ul>	Getting in deep water Getting out of locked doors

<ul style="list-style-type: none"> <li>- <i>I want you to think about scale of your pet/ toy: how is it seen from the top of Monas? how is it seen by an ant? how is it seen from its own inside?</i></li> <li>- <i>draw 3 additional angles where you won't normally see your pet/ toy from</i></li> <li>- <i>on the second page [may want to use acetate], I want you to explore ways how your pet/ toy can have its new function. think about the color. is it hard/ soft? is it detachable or not? can it expand? can you hide it?</i></li> <li>- <i>now assign the opposite of what you choose: use different color, texture, color, etc. from what you decide previously. how does this change the character of your pet/ toy?</i></li> <li>- <i>on the third page, do the same for second function</i></li> <li>- <i>on the fourth page, do the same for third function</i></li> <li>- <i>on the fifth page, do the same for the fourth function. take a word from box [adjectives words: cool, funky, clumsy, wild, etc.], and transform your pet/ toy to reflect this adjective.</i></li> <li>- <i>can you combine the four functions or would you rather they are separate? can one function transform into another? you can play around with the acetate. explore also what you can do with acetate: you can cut, crumple, fold, roll, twist your sketches. how do these treatment change your ideas?</i></li> </ul>	
<p><b>III. Keeping It Going</b></p> <ul style="list-style-type: none"> <li>- <i>show students comic strips. what does a comic strip have? [pictures, story line, sometime words]. what other things could it have? does it have to be flat [drawing]?</i></li> <li>- <i>now what do you need to think about to prepare making your comic strip? [story line]</i></li> <li>- <i>what kind of story lines you know? which one is your favorite? why? where did it happen? what happened? how did it end?</i></li> <li>- <i>so now you will need to think about storyline. where does it happen? your house? your yard? your school? your stomach? the jungle? the sky? outer world? underwater? toilet bowl? where would your pet/ toy not go? where would you not go? what would happen if it go there?</i></li> <li>- <i>what happened? you may want to take two things at a time: come up with a story how your pet/ toy would use one of the four functions. think about how your pet/ toy would relate/ play with you with this new function: would you want it to do things for you? are you part of the story? how? what would happen if you became enemy with your own pet/ toy? what did you think happen that cause this? what would happen if your pet/ toy became your master/ owner? would it get into trouble because of the new function? if so, what kind of trouble? how would it get out of it? how did your pet/ toy get into your stomach? or inside the toilet bowl? what must it do to get out of it? or where would it go from there?</i></li> <li>- <i>what would happen next? how would your pet/ toy use its two other functions? does your pet/ toy know how to use them all? is it clumsy/ savvy? what would happen if one of the functions do not work as intended and it's emergency?</i></li> <li>- <i>how would the story end? what would happen if the story never ends? or if the story ends where it starts?</i></li> </ul>	<p>Having a ball</p> <p>Singing in one's key</p> <p>Building sandcastles</p>
<ul style="list-style-type: none"> <li>- <i>once you have your story line, you can start making your comic strip.</i></li> <li>- <i>how can you put all the information [where, what happened, how did it end] in your comic strip? will it be through drawings or words or combination of both? is there any other ways? does it have to go in horizontal/ vertical strips? what other ways?</i></li> <li>- <i>you can look for references for your drawings in the library and use different medias: color pencils, color markers [of different thicknesses] → assume that this has been explored in previous lesson. I want you to re-explore how you can use these medias. how did we use them before? other ways we can use them now?</i></li> <li>- <i>how many strips do you need to create your story? do you need strips at all?</i></li> </ul>	<p>Plugging in the sun</p>
<ul style="list-style-type: none"> <li>- <del><i>could you have made your comic strip with only words or drawings? why?</i></del></li> <li>- <del><i>could you have made your comic strip and communicate the story in just 4 boxes?</i></del></li> <li>- <i>would you want to be a comic artist? why? what other ways can be used to tell a story? now I want you to pick a word from the box [list of simple random thing like tree, star, wall, table, chair, etc.]. how could you have told your story using these things?</i></li> <li>- <del><i>if yes, what do you need to do to make your comic better?</i></del></li> </ul>	<p>Shaking hands with tomorrow</p>

## Appendix L

### Application 2 Deliberate Use of the TIM Lesson Plan – Dancing Fingers

<b>Class</b>	E36 January Week 2	
<b>Project name</b>	Dancing Fingers	
<b>Designed by</b>	Kayee	
Contents	Artistic	1. Tracking movements to create patterns. 2. Pattern as repeated things (e46 only).
	Knowledge base	Movements of different animals.
Imagination	What could patterns representing animal movements look like?	
Creative Skill(s)	Let humour flow and use it	

<b>TIM Stages &amp; Strategies</b>	<b>Contents</b>	<b>AE Process</b>
1 Heightening Anticipation (tracking movements)  Tickle the imagination	Activity 1:  Give out rubber chicken feet to students. Ask them to put them on and imagine what footprints would be left behind by a running chicken? A sick chicken? A hopping chicken?	Knowledge base
2 Deepening Expectations (tracking movements)  Cutting holes to see through	Ask students: <ol style="list-style-type: none"> <li>1. why would a running chicken leave footprints?</li> <li>2. Can only feet leave prints?</li> <li>3. What other moving parts of an animal can leave prints?</li> </ol> Students may demonstrate with body or hands.	Explore concept and ideas / gather data
E46 only: 1 Heightening Anticipation (creating patterns)  Tickle the imagination	Start at one end of the room with an unrolled roll of wallpaper.  Roll out the wallpaper roll so only one row of pattern is showing.  Ask students to guess what the wallpaper will look like if you rolled it out a bit more.  Ask students how they would want the wallpaper to look like if you rolled it out a bit more.	Exploration / gather data Discussion
2 Deepening Expectations (tracking movements)  Cutting holes to see through	Roll out wallpaper row by row. Each time a row is rolled out, ask students if that is what they imagined it to be. Why?  When students get the idea that each row will look the same. Ask students to imagine themselves to be the printer of the wallpaper, how many times would they draw the rows of pattern?  (by the end of this discussion, students should establish that with a pattern, only one row of the pattern need to be created as other rows following are just a repetition of the first)	

<p>2 Deepening Expectations (tracking movements)</p> <p>E46 only: Cutting holes to see through</p>	<p>Create idea box with students:</p> <p>Diverge on animal, parts that move, state of animal / what can an animal be doing</p> <p>Ask students to mix and match the ideas and demonstrate the moving animal first with their bodies, then with their hands and finally by dipping their fingers into paint and with their fingers.</p> <p>Remind students that they should imagine that the animal is repeating the movement.</p> <p>Ask students to observe their prints. If they were a printer and were too lazy to create all those prints, which set do they did to create so they can repeat it to create the pattern?</p>	<p>Idea generation</p>
<p>3 Keeping It Going</p> <p>Having a ball</p>	<p>What other patterns can students create with their finger prints?</p> <p>What other patterns can students create with different moving parts of their bodies? In what kind of state? E.g a wobbling head bobbing up and down a swimming pool.</p>	

## Appendix M

### Application 2 Deliberate Use of the TIM Lesson Plan – Adopt a Pet

#### Skill = Combine & Synthesize

Adopt a pet

Strategy	Stage 1 Heightening Anticipation	Stage 2 Deepening Expectations	Stage 3 Keeping it going
<b>Desire to know</b>	Read a poem		
<b>Tickle with the imagination</b>	Show them hot dog with dog chain, French fries on the cage, rice fries on the aquarium, etc.		
<b>Get attention</b>	"We are going to make a new kind of pet."		
<b>Digging dipper</b>		What is pet? What is ur criteria fro the pet? What is ur favorite food?	
<b>Cutting corners</b>		Draw an animal and favorite food on the tracing paper. Combine the picture then cut the unused part of picture.	
<b>Having a ball</b>		Explore the clay then create the combination between food and animal.	
<b>Building a sand castle</b>			ask about the information about their pet.
			Put the pet on the pre make place.
<b>Shaking hand w/tomorrow</b>			make a story from combining place for the pet & info about pet.

## Appendix N

### Application 2 Spontaneous Use of the TIM Lesson Plan – Dancing Fingers

<b>Class</b>	E36 January Week 2	
<b>Project name</b>	Dancing Fingers	
<b>Designed by</b>	Kayee	
Contents	Artistic	3. Tracking movements to create patterns. 4. Pattern as repeated things (e46 only).
	Knowledge base	Movements of different animals.
Imagination	What could patterns representing animal movements look like?	
Creative Skill(s)		

<b>TIM Stages &amp; Strategies</b>	<b>Contents</b>	<b>Creative Skill(s)</b>
<p>1 Heightening Anticipation</p> <p>Get attention Arouse curiosity</p>	<p>Activity 1:</p> <p>Have prints of footprints of a kangaroo (or other animal) stuck on the floor. When students come in, ask them to follow the footprints and guess which animal would make prints like that. Ask them to try several ways of reproducing the footprints.</p> <p>After the children have tried to follow the prints, have a slide show of a kangaroo moving showing and ask students to follow the movement on the prints.</p>	<p>Keep open Make it swing!</p>
<p>2 Deepening Expectations</p> <p>Digging deeper</p> <p>Digging deeper</p> <p>Cutting holes to see through</p> <p>Looking twice</p>	<p>Activity2:</p> <p>Repeat Activity 1 with snake movement. Ask students to guess which animal movement they just imitated.</p> <p>Activity 3:</p> <p>Repeat Activity 1 with crab movement. Ask students to guess which animal movement they just imitated.</p> <p>Drawing it all together: Ask the students:</p> <ol style="list-style-type: none"> <li>1. were all the movements the same?</li> <li>2. How were they different?</li> </ol> <p>Finish off by getting students to follow footprints. Ask them to guess which animal they are imitating!</p> <p>Ask:</p> <ol style="list-style-type: none"> <li>1. how was human movement the same or different as animal movements?</li> </ol> <p>Activity 4:</p> <p>Ask students to imagine that their hands are the kangaroo, snake, crab and human.</p> <p>Ask one student to go to front of class and imitate movement of one of the animals with his hand. Ask class to guess which animal it is. For the student who makes the guess, ask the student to give a reason for the guess. Repeat until all the animals have been guessed.</p> <p>Activity 5:</p>	<p>Keep open Make it swing!</p> <p>Look at it another way</p>

<p>Looking thrice</p> <p>Give purpose &amp; motivation</p> <p>Looking for the 4<sup>th</sup> time</p> <p>Looking twice / digging deeper (patterns)</p> <p>Getting in deep water</p>	<p>Ask students to imagine their fingers are the legs of the kangaroo, crab, snake and human. (ask them to practice and try walking like the animals with their fingers). Ask students to dip fingers in paint and walk like the kangaroo, crab, snake and human.</p> <p>E46 only Bringing it all together: Choose the kangaroo or human movement prints: 1. do they see where the first set of steps are? 2<sup>nd</sup> set of steps? 3<sup>rd</sup> set of steps? (when the students see the sets of steps, ask them to circle them). Tell students that the steps that keep on repeating are called 'patterns'.</p> <p>Tell students that they will be working with patterns for the rest of the lesson.</p> <p>Ask students to point to the pattern of steps on the floor.</p> <p>Ask students if the different animal movement fingerprints create different or similar patterns.</p> <p>Ask students to explore what other patterns they can create with their fingerprints. Can they come up with patterns other people don't normally think of?</p> <p>What other patterns can they create using an oil pastel to link up their fingerprints?</p>	<p>Keep open Be original</p>
<p>3 Keeping It Going</p>	<p>Before the next class, students should:</p> <ol style="list-style-type: none"> <li>1. look out for an animal (any animal) and observe its movements, print the movements with fingers and create a pattern from them and share with the class next week.</li> <li>2. E46 only: look out for something that repeats.</li> </ol>	<p>Keep open Be original</p>

## Appendix O

## Application 2 Spontaneous Use of the TIM Lesson Plan – Adopt a Pet

## Adopt a pet

Strategy	Stage 1 Hightening Anticipation	Stage 2 Deepening Expectations	Stage 3 Keeping it going
Get attention and Arouse curiosity	<b>Visualizing richly and colorfully.</b> Bring five different pet to the class. Ask students to observe using five sense (touch, smell, etc)		
Give purpose and motivation	<b>Highlight the escence.</b> Why do we need pet? Why do want to have pet?		
Tickle Imagination	<b>Using movement and sound.</b> Asked student to pretend to be the pet. What kind of sound of the pet? What is ur favorite food?		
Heighten Anticipation & Expectation	Using Humour: Read " A light in the Attic" by Silverstein		
Listening for Smells		<b>Using Fantasy:</b> If your food now become a pet;	
Getting out locked doors		<b>Combine &amp; Synthesize:</b> How is it look like, What does it do, How does it sound etc	
Digging Deeper		<b>Visualizing Richly and Colourfully; Using fantasy, use humour:</b> Sketch your food pet; Add details	
Having a ball			Explore Clay, Start making the animal
Building Sand Castles			Refer to previous drawing of animal and compare their clay animal
Singing in one own's key			<b>Putting ideas into context, using unusual visual perspective:</b> Adding what you want your pet to have
Shaking Hands with Tomorrow			<b>Glimpse of future:</b> Create a story about your new pet; Give your pet a name
Closings			



## Appendix Q

## Analysis of Pre-TIM Lesson Plans Designed by Teacher K

## (Using the TIM as a Framework of Analysis)

## Analysis of Art Explore Lesson Plans Before the Introduction of TIM (Using TIM as a Framework for Analysis): Lessons Designed by Kayee

Lesson Plan Code	2.1.0	3.2.0	3.3.0	3.4.0	3.5.0
Lesson Plan for AE Age Group (in years)	3 to 6	3 to 6	3 to 6	3 to 6	3 to 6
Project Name	Apside dAwn and Absure A	Friend or Foe Part III	Filtering Lights Part III	A Stamp	Senseless A
Lesson Designer	Kayee	Kayee	Kayee	Kayee	Kayee
<b>TIM STAGES/STRATEGIES/CREATIVITY SKILLS</b>					
<b>Heightening Anticipation</b>					
Create the desire to know					
Heighten anticipation & expectation					
Get attention					
Arouse curiosity					
Tickle the imagination					
Give purpose & motivation					
<b>Deepening Expectations</b>					
Digging deeper					
Looking twice					
Listening for smells					
Crossing out mistakes					
Cutting holes to see through					
Cutting corners					
Getting in deep water					
Getting out of locked doors					
<b>Keeping It Going</b>					
Having a ball					
Singing in one's own key					
building sand castles					
Plugging in the sun					
Shaking hands with tomorrow					
<b>Creativity Skills</b>					
The problem					
Produce and consider many alternatives					
Be flexible					
Be original					
Highlight the essence					
Elaborate but not excessively					
Keep open					
Be aware of emotions					
Put your ideas in context					
Combine and synthesize					
Visualize it richly and colorfully					
Enjoy and use fantasy					
Make it swing! Make it ring!					
Look at it another way					
Visualize the inside					
Breakthrough-expand the boundaries					
Let humor flow and use it					
Get glimpses of the future					

## Appendix R

### Analysis of Pre-TIM Lesson Plans Designed by Teacher F

#### (Using the TIM as a Framework of Analysis)

**Analysis of Art Explore Lesson Plans Before the Introduction of TIM (Using TIM as a Framework for Analysis): Lessons Designed by Ferdi**

Lesson Plan Code	2.2.0	3.7.0	3.8.0	3.9.0	3.10.0	3.11.0	3.12.0
Lesson Plan for AE Age Group (in years)	8 to 12	8 to 12	8 to 12	8 to 12	8 to 12	8 to 12	8 to 12
Project Name	Metamorphosis	Twisted Things	Nightmare after Christmas	Apside dAwn and Apcoming Alphabet	A Whereabouts	Apple	Mass-producing Treasures
Lesson Designer	Ferdi	Ferdi	Ferdi	Ferdi	Ferdi	Ferdi	Ferdi
<b>TIM STAGES/STRATEGIES/CREATIVITY SKILLS</b>							
<b>Heightening Anticipation</b>							
Create the desire to know							
Heighten anticipation & expectation							
Get attention							
Arouse curiosity							
Tickle the imagination							
Give purpose & motivation							
<b>Deepening Expectations</b>							
Digging deeper							
Looking twice							
Listening for smells							
Crossing out mistakes							
Cutting holes to see through							
Cutting corners							
Getting in deep water							
Getting out of locked doors							
<b>Keeping It Going</b>							
Having a ball							
Singing in one's own key							
building sand castles							
Plugging in the sun							
Shaking hands with tomorrow							
<b>Creativity Skills</b>							
The problem							
Produce and consider many alternatives							
Be flexible							
Be original							
Highlight the essence							
Elaborate but not excessively							
Keep open							
Be aware of emotions							
Put your ideas in context							
Combine and synthesize							
Visualize it richly and colorfully							
Enjoy and use fantasy							
Make it swing! Make it ring!							
Look at it another way							
Visualize the inside							
Breakthrough-expand the boundaries							
Let humor flow and use it							
Get glimpses of the future							

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