

CHAPTER 18

Reflective Cheat Sheet

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“It is not sufficient simply to have an experience in order to learn. Without reflecting upon this experience, it may quickly be forgotten, or its learning potential lost. It is from the feelings and thoughts emerging from this reflection that generalizations or concepts can be generated. And it is generalizations that allow new situations to be tackled effectively.”

- Gibbs (1988) in *Learning by doing: a guide to teaching and learning methods*.

INTRODUCTION

The world is becoming complex; with the Internet of Things, AI, and social media, a vast amount of information is becoming available at the tip of our fingers. New knowledge is being created and information is rapidly changing. What was relevant yesterday, might not be relevant today. To match pace with this rapidly changing world, we need to constantly rethink, switch directions, and change problem-solving strategies. Thus, it is becoming increasingly imperative for us to develop reflective thinking among students from early on. This will help learners become critical of the events around them and the information they receive and develop strategies to apply new knowledge to the complex situations in their everyday life. Reflective thinking, also known as reflection, is a critical thinking process that refers to the processes of analyzing and making judgments about an event that the learner has witnessed and experienced. Dewey (1933) suggests that “reflective thinking is an active, persistent, and careful consideration of a belief or supposed form of knowledge, of the grounds that support that knowledge, and the further conclusions to which that knowledge leads.” During learning scenarios, learners are aware of and in charge of their learning by actively participating in reflective thinking - examining what they know, what they need to know, and how they bridge that gap. It is a meaning-making process that leads a student from one experience to the next with a better grasp of how it relates to and connects to other concepts and experiences.

Reflection is the instrument by which experiences are translated into dynamic knowledge. Including reflection in the learning process has many benefits in terms of the development of an individual's dispositions towards situation analysis, problem segmentation, solution analysis, and conclusions.

ADVANTAGES OF REFLECTION IN THE LEARNING PROCESS

1. **Analysis capacity:** Reflective individuals can define & analyze their experiences more clearly. They find it easy to interpret situations in a profound way to reach a clearer conclusion.
2. **Active listening:** A reflective person is an active listener as he or she is aware that through the discourse of others, valuable information is obtained from which an analysis can be made.
3. **Observation skills:** Reflective individuals are more observant of their surroundings and see all the experiences as meaningful experiences.
4. **They are patients:** Reflective people are patient and know that acting impulsively would be counterproductive to their interests. Reflective people do not usually act at the first sign of change but take the time to obtain as much information on the subject as possible to allow for reflection or analysis.
5. **Managing emotions:** A reflective person has good handling of his/her emotions since he/she can reflect on them. They are self-aware, practice self-regulation, and show a high level of emotional intelligence.
6. **Evaluate pros and cons:** Reflective individuals know how to discriminate between the pros and cons of the situations that occupy our analysis. Therefore, reflective people are rational decision-makers and reach a better conclusion.
7. **Planning skills:** Reflective people know how to structure and organize their experience in a way where every detail counts. Reflective people plan based on the information they have to see how their reflection can be shaped, or whether new information on the subject of analysis is needed.
8. **Objectivity:** Reflective individuals practice introspection and are aware of their biases. Furthermore, they are capable of viewing a situation independently of their biases and thinking objectively.
9. **Internalize learning:** Reflective individuals internalize experiences significantly. This gives them adequate learning about the event they have experienced.

Reflective thinking offers a multitude of benefits as illustrated above, however, too often, students do not know how to reflect on experiences, critically or otherwise. Nielsen et al. (2007) stress the importance of having a structure that allows students to write more in-depth accounts of their experiences and their thoughts about them.

The reflective cheat sheet tool enables the teacher to structure students' reflection process by dividing the reflective practice into three parts namely, tactile, strategic, and takeaways. This kind of scaffolding in reflective thinking gives students' thoughts a direction on what to consider while engaging in reflection. In short term, the tool will help learners engage with the experience in the following ways:

- Rethink about the experienced event/activity objectively,
- Rethink about their responses during the activity,
- Understand their own thinking and learning strategies,
- Identify new knowledge from the experience and link it to the prior understanding,
- Develop novel strategies that they can employ in similar situations.

In long term, using a reflective cheat sheet will help learners become critical and reflective thinkers who are capable of lifelong learning as they constantly analyze, question, and critique established assumptions.

Reflective Cheat Sheet: What is it?

Self-discovery is a big part of reflective thinking and writing. The reflective process, according to Cottrell (2010), is difficult because we don't always prefer to learn the truth about ourselves, and the things we most need to know are often the most difficult to hear. Anyone can develop effective reflective thinking skills with time and practice. Furthermore, as Fischer and Pruyne point out, reflective thinking is not a preordained ability that arises at a specific age or stage of development; rather, it is a skill that must be methodically developed like any other skill, in this case, via enhancing abstract systems thinking capacity. According to a study conducted by Stel (2011), the age of 15 years is a critical point in the development of metacognitive skills. The author further emphasizes that growth dominates the development of metacognitive abilities in kids aged 12 to 14, increasing both the frequency and quality of metacognitive skills. Post 14 years of age, the development of metacognitive skills can be fostered by the generalized application of these skills. As a result, students around the age of 15 will be able to transfer metacognitive skills learned in one task or domain to new tasks or domains with growing ease. Therefore, it is essential to guide students through reflective cues. A reflective cheat sheet is a pedagogical tool that consists of questions that encourage reflection among students after a high-impact experience. It can be used for secondary school students (classes- 9th to 12th) so that they can become reflective practitioners. **The pedagogical tool aims to foster secondary school students' analytical and critical thinking skills.**

As a guide to belief and behavior, critical thinking is an intellectually disciplined process of deliberately and skilfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, ob-

servation, experience, reflection, reasoning, or communication (Scriven and Paul, 1987). Halpern (1996) describes critical thinking as the use of those cognitive skills to increase the likelihood of the desired outcome. The author suggests that critical thinking that is purposeful, reasoned, and goal-directed - the type of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions - occurs when the thinker employs skills that are thoughtful and effective for the context and type of task at hand.

Besides, analytical thinking is defined as the capacity to recognize and characterize problems, extract crucial information from data, and build practical solutions for the problems discovered to test and verify the origin of the problem and develop solutions to resolve the problems identified (Chicago State University). Analytical thinking skills allow a person to make sense of new information by connecting it to previously acquired knowledge, as well as anticipate correlation and develop new knowledge.

Developing reflective thinking skills is important to promote critical and analytical thinking skills as it encourages the student to be a reflective partitioner who is highly aware of their experiences, their thought process, and strategies in a complex problem-solving situation. Reflective thinking allows students to take a step back and consider how they solved the problem in the past and how a certain set of problem-solving tactics might be used to achieve their goal in the future. Reflective thinking fosters self-awareness and self-confidence, which prompts students to take informed actions. Practicing reflection in the classroom will empower the students to self-regulate themselves during complicated situations because their brains will be trained to pause in the midst of chaos, disentangle and sort through observations and experiences, consider numerous possible interpretations, and generate meaning. Deliberately engaging students in the reflective process encourage them to practice objective, multi-perspective analysis that helps them make rational decisions. Reflective questions guide students in identifying various components of the experiences, organizing their thoughts and feelings, and therefore, it helps students make sense of their situation and extract relevant information from it. This way reflection can promote critical and analytical thinking in the students.

The theoretical background of the tool: On which theories is the tool based?

The reflective Cheat Sheet tool is based on the following theories and models.

Donald Schon's reflective practices theory (1983)

The notions of reflection-in-action and reflection-on-action were introduced by Donald Schon. Reflection-in-action, according to Schon (1983), allows for continuous interpretation, analysis, and reflective conversation with oneself about the situation while using information obtained from previous experienc-

es to inform and lead new actions. Reflection-on-action refers to reflection that takes place after an experience and encourages the learners to think about what they did, what they felt, what they could have done better, and what did they learn. The reflective cheat sheet comprises questions that motivate students to engage in reflection-on-action. Moreover, continuous use of reflective cheat sheets in the classrooms will develop students into reflective practitioners who are capable of reflection-in-action as well.

Gibbs Reflective cycle

The tool also has the components of Gibbs' Reflective Cycle. In 1988, Graham Gibbs developed the Gibbs' Reflective Cycle to help people learn from their experiences. The cycle offers a framework for understanding, analyzing, and examining the experiences. Gibb's reflective cycle contains six stages description, feelings, evaluation, analysis, conclusion, and action plan described briefly as follows:

1. Description of the experience.
2. Description of feelings and thoughts about the experience.
3. Evaluation of the experience, both good and bad.
4. Analysis to make sense of the situation.
5. Conclusion about what you learned and what you could have done differently.
6. Action plan for how you would deal with similar situations in the future, or general changes you might find appropriate.

The reflective cheat sheet tool accommodates the 6 stages of Gibbs Reflective cycle into three simple steps namely: Tactical [that entails a description of the experience and analysis of feeling and thoughts about it], Strategic [that encourages the learners to undertake an evaluation of their responses and actions during the activity], and takeaways [conclusion about what was learned about self and what can be done differently in the future].

Borton's Learning Cycle (1970)

According to Borton (1970), reflection has three elements that ask the practitioner: What, So what, and Now what. "What" is the element that describes the event, what you and others have been doing. The second component "So what" helps the learner make sense of what has happened in the situation you described and to consider what the learner learned from the experience. The "Now what" element prompts the learner to think about how they can improve their strategies in the future. The reflective cheat sheet caters to all the components of Borton's Learning Cycle.

Kolb's reflective model (1984)

Learning theorist David A. Kolb proposed a reflective model that emphasizes the concept of experimental learning and is focused on the transformation of data into knowledge. This entails four phases namely, Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. The tool "Reflective Cheat Sheet" can be administered after a High-impact experience. The high-impact experience should be a concrete experience that the teacher should engage the students in. The teacher can use reflective cheat-sheet regularly in her classrooms so that students remain vigilant of their actions, thoughts, and feeling during all the learning experiences, and this will enable them to make reflective observations during and after the activity. The tool has the element of "Takeaways" that can be equated with the "Abstract Conceptualization" phase of Kolb's model. The teacher can engage students in the last stage of the model, i.e., "Active Experimentation" by consistently exposing them to high-impact experiences.

LITERATURE REVIEW

According to Colley, Bilics, and Lerch (2012), with today's multinational, multicultural, complex concerns, citizens must be able to filter through large amounts of various data to make educated and informed decisions. Therefore, higher education must focus on critical thinking skills a priority to give students the intellectual training they need to engage in this fast-paced environment. Moreover, according to the study conducted by the McKinsey Global Institute on the Indian labor market, soft skills - critical, analytical, and creative skills - will soon become a must in the Indian productive sectors (2018). Critical thinking as theorized by Scriven (1985) is "the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action." Colley, Bilics, and Lerch (2012) argue that critical thinking skills enable citizens to thrive and participate in this dynamic world. Nuraini, Cholifah, Mahanani, and Medina (2020) claim that doing in-depth studies of scientific knowledge and conducting scientific studies to be able to adapt them to new scenarios will help train critical thinking skills and improve creative thinking skills.

Mälkki (2011) while exploring the challenges and prerequisites of reflection suggests that social influence and environment provide support to question one's assumptions and produce challenging viewpoints. The author further points out that in conditions where reflection is encouraged, the emotional risks of reflection are mitigated by a supportive social context that eliminates social dangers and gives emotional support for dealing with incompleteness. (as cited in Malkki, 2011). Malkki (2011) concludes that reflection teaches the learner to accept

their unpleasant feelings and detect in one's own thinking their tendency to orient interpretations in favor of maintaining the comfort zone.

Dewey (1933) proposed that practical occurrences that cause feelings of unease or bewilderment, as well as a sense of wonder and awe, might trigger reflective thinking. He asserted that reflective thinking was different from everyday routine thinking, and especially from impulsive thinking. He proposed that routine thinking (and any subsequent actions) resulted from an individual's automatic conformity to rules originating from authority or tradition (Dewey, 1933). In contrast, reflective thinking resulted in an 'intelligent action' (Calderhead, 1989), because in reflective thinking, the practitioner has engaged in rationally analyzing the issue and gone through stages of doubt and uncertainty while working toward a solution. Dewey (1933) defined reflection as persistent, reasoned thinking that was guided by the goal in mind. Additionally, Nuraini, Cholifah, Mahanani, and Meidina (2020) assert that reflective thinking allows the thinker to take a step back and consider the best technique for reaching a goal, which stimulates the thinker in problem-solving situations. The authors while citing Sabandar (2013) state that the ability to think reflective includes the ability to think critically and think creatively as well as other thinking skills. The authors propose that the ability to think reflectively accounts for half of the problem-solving process.

Rüütmann (2019) described "reflection as a universal mechanism for self-development and self-changing as a part of students' learning process and development." The author emphasized that the teacher should create conditions for the development of student reflection. Collaborative group work, muddy cards, peer instruction, reflection quizzes, visual diagrams, student-led recitations, project-based learning, simulations, case studies, journals and portfolios, problem-based learning, a compilation of test questions, and the INSERT Method are among the activities that teachers can do with their students to foster their reflective and creative thinking skills. To assist students to become significantly better at creative and critical thinking than they were at the beginning of the course, teachers should convey to them the examples of the kind of thinking teachers have in mind; assign students tasks and assignments that require that kind of thinking; give them feedback; and repeat (Brent and Felder, 2014). Teachers can promote reflection in students in both online and offline contexts. Through their research, Yilmaz and Kesar (2016) prove that reflective thinking activities can also be carried out during e-learning. They discovered that using podcasts in conjunction with reflecting activities was more effective in assuring post-test success and motivation than other ways. Xiao, Clark, Rosson, Carroll, and John (2008) claims that promoting reflexivity or helping students think about how they approach challenges and how they seek and find solutions, is critical. Their study reveals that engaging learners in the process of documenting decision rationales helped them clarify and articulate their thoughts and

ideas, effectively explore the course concepts, and participate in higher-order thinking.

Jha and Shah (2018) describe the main components of reflective thinking as 1. Experiencing something, 2. Thinking about what happened, and 3. Learning from our experience. The authors emphasize that reflective thinking aids in identifying the areas for change and improvement, developing a questioning mindset and fresh views, effectively responding to new difficulties, applying knowledge of what they have learned, and generalizing and thinking in new ways.

Overall, reflection can be seen as a process of looking back at an experience and learning from it. Reflective thinking is a very important skill that helps individuals make rational decisions about their choices and actions in this dynamic and chaotic world. Encouraging students to think reflectively enhances their critical, creative, and analytical thinking skills. An emotionally safe, non-judgmental learning environment that provides meaningful experiences is a prerequisite to engaging students in the process of reflection.

EXPLANATION OF THE TOOL: HOW IS THE TOOL?

A reflective cheat sheet is a pedagogical tool that will scaffold the learning of reflective thinking skills for students. The tool can be administered after a high-impact activity to help the learners consolidate their learnings from the activity.

The tool has three components namely:

1. **Tactical:** This is the first element of the reflective cheat sheet. The questions under this category encourage the learner to identify a moment in the High-impact activity that created feelings of disquiet or confusion or by a sense of wonder and awe in them. The questions that can be asked under this component are:
 - Identify something you experienced or observed during the activity that surprised/shocked/baffled you?
 - What happened [respondent's observations about the event]?
 - What did this incident result in?
 - Why did it happen?
2. **Strategic:** This component of the reflective cheat sheet prompts the learners to analyze the causes of the incident that they identified in the tactical component of the tool. The questions that can be asked in this part are:
 - What actions [of the learner and other participants] explain the causes and effects of the incident?
 - What change in the actions [of the learner and other participants] would have prevented the incident from happening?

3. **Takeaways:** This element of the reflective cheat sheet encourages the learner to identify their learning from the experience. This also prompts them to think about ways in which they can apply their learning to the new experience. The questions that can be asked in this part are:
- What kind of improvement do you see in yourself after the activity?
 - Have any of your previous beliefs about this issue changed?
 - What did you learn from the incident?
 - How will you apply your learning to other such situations?

Note: These questions are listed only for suggestive purposes and the teacher can change the questions in each category depending on the experience they expose their students to.

Expected outcome of the tool: Students engage in introspection & reflection on their behavior, attitude & action during High Impact Activity.

Allocated time: Two Sessions (First for High impact activity and Second for Reflection).

Setting, place layout: The teacher can select two different places for the tool administration. The first place can be selected based on its appropriacy to carry out a high-impact activity. The second place can be any space that is peaceful and where students will feel safe to introspect.

Necessary materials: High impact activity, Reflective cheat sheet, Student and Teacher.

Number of Participants: The teacher can independently conduct and observe a high-impact activity of 20 teens and thereafter administer the reflective cheat sheet. The teacher can also include a supporting teacher and extend the number of students in a high-impact activity to 40 teens.

Steps of the implementation:

The tool can be administered in three steps namely: 1. Orienting the students about the goal of the activity, 2. Exposing students to the high-impact activity and 3. Encouraging students in the process of reflection using the reflective cheat sheet.

1. **Orienting the students about the goal of the activity:**

In this step the teacher can talk to students about:

- What activity are the students going to participate in?
- Why are they participating in the said activity?
- What does the teacher expect from the students during and after the activity?
- What points should the students consider while engaging in the activity?

- What is reflection?
- Give examples of reflective thinking by demonstrating it?
- Explain the tool reflective cheat sheet?

2. **Exposing the students to a high-impact activity:**

A high-impact learning activity is a hands-on experience in which students are encouraged to apply their higher-order thinking skills. A high-impact activity should encourage the student to brainstorm, strategize and execute their plan. Some of the high impact activities that the teacher can organize for the students are:

a. **Classroom Discussions**

Classroom Discussions help students understand, articulate, and inspect their understanding of various concepts and think about how they can apply those concepts in solving the problems of the day-to-day life. Discussions help the students to broaden their thinking abilities and engaged them in reasoned argumentation and rebuttal. Through discussion, many skills, and qualities like assertiveness, listening skills, and interpersonal skills can be improved.

b. **Role Plays**

Role plays expose students to situations that they might not experience in daily life and hence engages them in multi-perspective and abstract thinking. Roleplay also facilitates the practicing the skills and provides a better understanding for handling real-life problems.

c. **Group tasks**

When the number of students is high and time is limited, groups are helpful for better results. It facilitates the interpersonal skills of the students and learns how to work as a team through effective communication and understanding. It is also helpful for developing empathy.

d. **Games and Simulation**

Games are the favorite learning activities of most students irrespective of age. Games demands skills like interpersonal communication, teamwork, planning, etc. It provides a safe and stress-free classroom atmosphere and facilitates the practicing of many skills.

e. **Situation analysis tasks and Case studies**

Situation analyzing and case studies give students an opportunity of indulging in problem identification, segmentation, analysis, and solution generation. Engaging in such activities helps develop students' interpersonal skills, communication skills, analytical and critical thinking skills, and problem-solving skills.

f. **Story Telling**

Storytelling helps children to develop creative and critical thinking. It allows them to draw analogies with real-life situations. It also enhances the skills such as listening skills, attention, and endurance.

g. **Debates**

Debates can be organized in class to encourage students to pursue a thorough engagement with the topic. Debates help foster skills such as assertiveness, communication skills, listening skills, critical thinking, empathy, and tolerance.

During these activities, the teacher can act as a moderator and facilitator while making student observations to analyze their strategies and activity as a whole.

3. **Engaging students in the reflection process: How are the students engaged in the reflective process?**

The teacher can administer the reflective cheat sheet immediately after the activity or can decide to give students time to process their experience by giving them an incubation time of at most 2 days. Before, administering the tool, the teacher can orient students about why the tool is being used and that their responses will not be judged as right or wrong. The teacher can then distribute the reflective cheat sheet to the students and give them 30-50 mins to fill it out. The time allocated for filling the reflective cheat sheet will correlate to the intensity of the high-impact activity.

While the students are filling out the reflective cheat sheet, the teacher can observe the class and see if any students seem to have a problem. The teacher can then help students understand the questions asked better.

A specimen of the reflective cheat sheet is illustrated below. The teacher can pick questions from the specimen to include in their reflective cheat sheet or draft a completely different reflective cheat sheet.

	Question	Your response
1	1. Identify something you experienced or observed that <i>surprised you</i> during the experience. 2. What about the process or the completed product was particularly fulfilling/satisfying to you? 3. What was/is frustrating about it for you?	

2	<ol style="list-style-type: none"> 1. What happened? What did you observe? Be specific. 2. What did you learn about yourself as you worked on this piece? 3. What difficulties did you face while working on this piece? What method did you use to solve them? 	
3	<ol style="list-style-type: none"> 1. What were the results? 2. What were your expectations for this project/activity? 3. Did you live up to your expectations? 4. If you were the teacher, what comments would you make about your performance/piece? 	
4	<ol style="list-style-type: none"> 1. What conclusions did you reach? 2. One thing/area I would like to improve is 3. What's the one aspect in your classmates' work or process that you would like to try in your next piece? 	
5	<ol style="list-style-type: none"> 1. Why did the results work out this way? 2. What are things you might want more help with? 	
6	<ol style="list-style-type: none"> 1. What are the strategic elements (principles or theoretical framework) that explain your results? 2. What process did you go through to produce this piece? 	
7	<ol style="list-style-type: none"> 1. What is the lesson(s) learned from your reflection? How will these transfer into new situations or real-life challenges? 2. How much did you know about the subject before we started? 3. What kind of improvement do you see in yourself? 4. Have you changed any ideas you used to have on this subject? 	

Adapted from "Reflect on a High-Impact Experience: Moving from Specific to General" by Cindy Raiser. Retrieved from https://docs.google.com/document/d/1Wxbjp_hEfUCyiUy2QKqLY25gy4ps-9DtbrLTvCnW2TeY/edit

ROLE OF STUDENTS & TEACHERS

Role of Teachers:

In the reflection process teachers' and students' role is most important. During classroom transactions, for better learning, the teacher has the role of:

1. Orienting students about the aim of activity being conducted.
2. Designing high-impact experiences that engage students in brainstorming, production of ideas, articulation of ideas, argumentation, refutation & consolidation. These high-impact experiences can be anyone out of the ones described above.
3. Moreover, as part of pre-instruction planning, teachers should prepare and provide a rubric to the students. The rubric should be framed according to the learning objective of the high-impact activity and reflection. This will enable teachers to facilitate the learning of the students in the way they want.
4. During the high-impact activity, teachers' role is facilitation and continuous monitoring.
5. During reflection activity, the teacher's role is to encourage students to express views and ideas clearly. The teacher also should provide clarification to the students if any question of the reflective cheat sheet is unclear.
6. After the reflection activity teacher's role is to provide qualitative feedback to students on their performance on the high-impact activity and how can they make their reflection better.

Role of Students:

The pedagogical tool "Reflective cheat sheet" allows students to see the importance of their own learning process. Students can learn about how they react to situations, what they did well, where they failed, where they need improvement, what they want to learn more, what they would change if given another opportunity, and what change do they see in themselves after the activity. Students' role in this tool is of an objective observer, a rational critique, and an active participant. Before the activity, students should go through the rubric for the activity provided by the teacher to give higher selective attention to some aspects of the high-impact activity over others. During the activity, students need to be self-aware of their feelings, emotions, responses, and actions. This will help them reflect after the high-impact activity. During the reflective process, students should try to articulate their thoughts coherently and clearly. Students can and should seek the support of the teacher whenever they are doubtful about any aspect of the activity.

CONCLUSION

Reflection is a meaning-making process that allows a student to move from one experience to the next with a better knowledge of how it connects to and interacts with other concepts and experiences. Reflective thinking skills are one of the most important skills in the present world. With information overload, misinformation, disinformation, and new information being generated every day, it is essential for all individuals to make rational choices. Reflective Cheat Sheet is used as a pedagogical tool that helps the learners become self-aware and fosters their analytical, creative, and critical thinking skills. The tool can be used in any context – online or offline – and can be modified as per the level of the learner. The tool helps the students become life-long learners who imbibe best from each experience.

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