

**The Handbook of
Interactive Problem Finding and
Solving Style of Education:
An Introductory Implementation Guide
for Your Classroom**



早稲田大学 大学総合研究センター
Center for Higher Education Studies, Waseda University

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1. What is the “Interactive Problem Finding and Solving Style of Education”?

1.1 Background

Waseda University currently lists 13 core strategies with the framework of the four main strategies “Admissions Strategy”, “Education and Learning Strategy”, “Development Strategy”, and “Management Strategy” towards the implementation of Waseda Vision 150. One of the Education and Learning Strategies listed is the “Interactive Problem Finding and Solving Style of Education”. The objective is as follows.

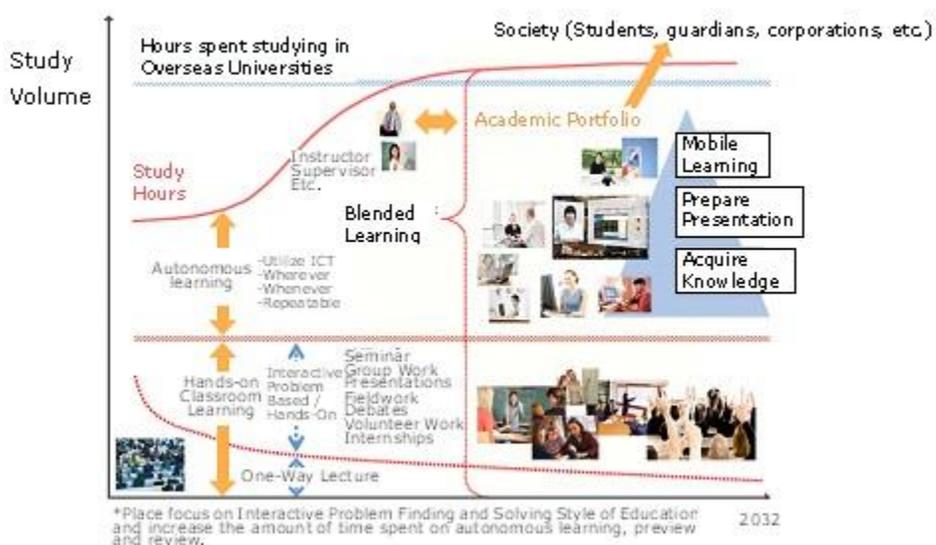
Waseda University shall, among other initiatives, seek to develop environments for distance and on-demand learning in which a variety of networks are utilized; innovate the way in which educational materials are developed; and reform the style of education. The aim is to switch the emphasis from a style of education centered on lectures unilaterally given at classroom, to an interactive style of education centered on seminars in which students' active participation is required and to project-based education in which fieldwork is conducted by students. The ability to find problems, propose plans to resolve the problems, and carry out the plans shall thus be nurtured.

In addition, the focus of the reforms is consolidated into the following two points.

1. Improve measures to utilize the information and communication technology (ICT) aimed at lightening faculty's burden and to support faculty. Shorten the class period which members of the faculty are in charge of.
2. Consider the very purpose of the interactive problem finding and solving style of education, in which members of the faculty give instruction more intensively and, concurrently, which is formed on the initiative of students. Also consider how the University can support such a style of education.

Various teaching methods have been suggested in relation to the “Interactive Problem Finding and Solving Style of Education” for Waseda Vision 150 based on the knowledge of teaching and learning theories accumulated to date. Here we will present suggestions regarding the Interactive Problem Finding and Solving Style of Education, and discuss the similarities and differences between active learning, problem-based learning, cooperative learning, and action learning.

[Visualization of the Transition to Interactive Problem-Based Learning and Changes in Study Habits]



1.2 Active Learning

First, we will discuss Active Learning. Bonwell and Eison (1991) described the five following characteristics as being commonly associated with active learning.

- Students are involved in more than listening
- Less emphasis is placed on delivering information and more on developing student's skills
- Students are involved in higher-order thinking (analysis, synthesis, evaluation).

- Students are engaged in activities (e.g., reading, discussing, writing).
- Greater emphasis is placed on students' exploration of their own attitudes and values.

There are three main educational methods of active learning, namely Team Based Learning (TBL), Workshop Based Learning (WBL), and Problem Based Learning (PBL), which in that order involves increasing levels of autonomous student participation (Refer to Table 1) (Yamashita, 2014).

Educational Method	Student	Instructor
TBL	Cooperator	Leader
WBL	Leader	Facilitator
PBL	Facilitator	Coordinator

Ibaraki University defines their implementation of active learning as follows.

Active learning is a name for method of teaching which engages students in active styles of learning, and includes Student Centered Courses that utilizes tools such as Clickers, Collaborative and Cooperative Learning, as well as Problem Based Learning. These courses integrate various components such as data collection, listening, awareness, problem recognition, logical thinking, critical and creative thinking, and problem solving. The inclusion of such components results in highly effective education that allows students to learn autonomously, understand through experience, self-relativize, and understand others (Ibaraki University).

The definition employed by the Japan Ministry of Education, Culture, Sports, Science and Technology is as follows.

A general term for teaching and learning methods which involve active participation in learning by students, unlike educational methods which involve one-way lectures given by teachers. The aim is to cultivate a general spectrum of abilities including cognitive, logical and social abilities, sophistication, knowledge, and experience through active student

participation in the learning process. While it includes methods such as discovery learning, problem based learning, experiential learning, investigative learning, other methods such as group discussions, debates, and group work in the classrooms or university libraries are also effective active learning methods. Oyama and Taguchi (2013) described active learning as an "Education Method for stimulating proactive learning by the student", and defined classes that use such teaching methods as "Active Learning Type Classes".

Mizogami (2014, P.7) used the following definition.

"[It] refers to an active form of learning, in that it goes beyond passive forms of learning such as one-way transfer-of-knowledge type lectures. Active forms of learning are accompanied by the involvement of activities such as writing, speaking, and presenting, and the externalization of the cognitive processes occurring as a result of said activities.

Matsushita (2015) defines active learning from six perspectives, adding Mizogami's (2014) "Accompaniment of the externalization of cognitive processes" to Bonwell and Eison's (1991) definition.

1.3 Problem Based Learning and Project Based Learning

Problem Based Learning was first promoted during the 1960s, and Project Based Learning became popular from around the 1990s (Yuasa, Oshima & Oshima, 2011). Within Japan, Mie University has systematically implemented it, and states the following.

At Mie University, Problem Based Learning is also called “Problem Finding and Solving Based Learning”. “Problem” in this context refers to “Learning Assignments” that students must study in order to solve problems and assignments given by faculty through specific examples. The term “Problem Finding and Solving Based Learning” reflects the anticipation that it will promote self-determinate learning in which students autonomously set and work towards their own goals of learning. (Mie University, 2007)

Mie University described the following as the three basic conditions for PBL education.

1. Learning is carried out in the following order: Introduction to the problem, finding the assignment to be solved, acquisition of knowledge through learning, deepening of thought process through discussion, and problem resolution. (Problem based)
2. Learning is carried out through self-determinate and active learning by students. (Self-determinate Learning)
- 3 Use an assessment method that stimulates self-reflection by students, and assesses the process and outcomes of active learning. (Formative Assessment)

The following 10 characteristics are described as well.

1. Students, through example scenarios etc., are introduced to specific examples that are realistic and familiar.
2. Students acquire in-depth knowledge and advanced thinking ability in relation to problem solving.
3. Students determine their own learning objectives.
4. Students actively advance their learning.
5. Students actively acquire knowledge and deepen their thinking through self-learning and group-learning (discussion).
6. Faculty serve the role of facilitator (learning supporter), and students receive support from faculty when necessary.

7. The necessary learning resources, time, and spaces are secured for students.
8. The time and spaces necessary for learning outside the classroom are secured for students
9. Self-reflection by students is encouraged.
10. An evaluation method for assessing the process and results of active learning by students is implemented.

Hiroshima University recommends the implementation of PBL as a form of active learning in their “General Education Seminars”, which are mandatory for freshmen, in an effort to improve teaching methods towards the establishment of autonomous learning by students. (Yoshida, Ozawa, Oho, Furusawa, Nishibori, & Denji, 2013).

Lastly, I introduce the definition given by the Advanced Institute of Industrial Technology.

Project Based Learning (PBL) is an educational method that is effective in cultivating competent human resources capable of immediately joining society as active participants, in which multiple students acquire the skills and know-how necessary to contribute to society through the process of establishing clear objectives and completing projects that simulate carrying out tasks in a real world work environment. While traditional graduate schools often require the completion of a thesis as a condition of graduation, PBL differs significantly in that multiple students work as a team, the process is evaluated as well as the results, and detailed presentations are given regarding the results of the projects. In order to ensure that students acquire practical competency, our institute mandates that students acquire fundamental knowledge and skills during their first year, then implement PBL during their 2nd year as a requisite condition of graduation. PBL is an educational method with a relatively short history, but AIIT, as a leader in the development of PBL, is committed to staying in the forefront of its implementation (Advanced Institute of Industrial Technology).

1.4 Cooperative Learning

Johnson, Johnson and Smith (1991) defined cooperative learning as follows.

“Cooperative learning is the instructional use of small groups so that students work together to maximize their own and each others' learning.”

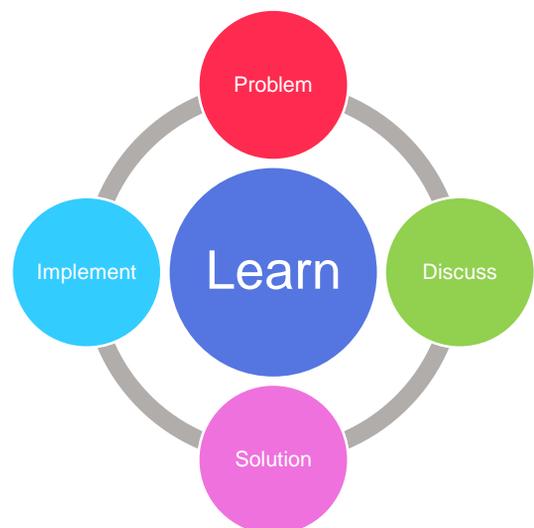
Johnson and Johnson (2005) listed the following 5 items as the basic factors in differentiating cooperative learning from group activities.

- (1) Positive interdependence
- (2) Promotive interaction
- (3) Individual accountability
- (4) Appropriate use of interpersonal and small group skills
- (5) Reflecting upon and making improvements to the collaborative process

1.5 Action Learning

While Action Learning is a method used more often for purposes such as human resource development by industry rather than higher education, research regarding the transition from school to work has recently gain popularity, and this method is now being frequently implemented towards purposes such as leadership training.

According to Marquardt (2004), action learning is a problem solving method that is effecting in leader cultivation, team building, and organizational development through practical work. It is a process in which individuals, groups, and organizations learn through action while solving real world problems in small groups.



1.6 Definition of the “Interactive Problem Finding and Solving Style of Education” based on Teaching and Learning Theories



The Interactive Problem Finding and Solving Style of Education can be defined as follows.

An interactive format of education in which students exchange ideas with faculty or each other, depending on class setting and size, to deepen their understanding of the class content, or a problem-based format of education which cultivates students ability to utilize their academics towards the discovery and analysis of complicated social issues.

1.7 Implementing the Interactive Problem Finding and Solving Style of Education

The current implementation rate of the Interactive Problem Finding and Solving Style of Education is 29% for undergraduate and 55% for graduate courses, but the goal as prescribed by WASEDA VISION 150 is 75% for undergraduate and 80% for graduate courses. To assist with the achievement of this goal, this handbook will introduce methods for Group Work, Debate, Field Work, Presentation, and Retrospection. For more information regarding the selection of activities, please refer to Collaborative Learning Techniques: A

Handbook for College Faculty” by Barkley, Major and Cross (2014).

When implementing in a real classroom, the selection and timing of activities becomes very important. Table 1 below is a general summary of activities and which phase of the day’s lesson they should be implemented. Please feel free to make use of this handbook to help you design your own Interactive Problem Finding Solving Style lesson in accordance with your class size and setting.

Table 1. Active Learning Methods by Class Phase

Class Phase	Name of Activity
Ice Breaking	Choose 3 Self Introduction Attack 25
Introduction	Think-Pair-Share Peer Instruction Round Robin Buzz Groups
Development	Paper Seminar Three-Step Interview Peer Editing Collaborative Writing Micro Debate Critical Debate Send-a-Problem Case Study Structured Problem-Solving Group Investigation
Reflection	Minute Paper Review Sheet
Assessment	Rubric Assessment Portfolio Assessment Peer Assessment

2. Tips for Interactive Problem Finding and Solving Style of Education

2.1 Techniques for Ice Breaking

Choose 3 and Self-Introduce

Group Size: 4-6

Time on Task: 5-6 minutes

Description: This activity is an ice breaker in which group members use the matrix below to introduce themselves, to improve relationships within the group.

Procedure

1. Separate students in to groups of 4 to 6.
2. Students choose three topics and mark them with a circle.
3. Each student introduces themselves using the chosen topics.

Matrix Sheet for Choose 3 and Self-Introduce (Nakai (Ed)., 2015, p.194)				
Something you worked hard for	Future Dreams	Part-time Job	Food you hate	Family
Favorite Course	Brag about your hometown	College life	Country you want to visit	Favorite Food
Hobby	Favorite Movie	High School Days	Someone you look up to	Anything

Attack 25

Group Size: Entire Class
Time on Task: As appropriate

Description: An ice breaker in which students ask each other questions and grow their relationship.

Procedure

1. Students use question sheets such as shown below to ask each other questions.
2. Each student is asked one question, and the activity proceeds until all questions have been answered.

Attack 25 Example (Nakai Ed., 2015, p. 195)			
	Name	Question	Answer
1		Hometown	
2		Favorite Music	
3		Yesterday's Dinner	
4		Hobby	
5		Obsession in high school	
6		Nickname	
7		Favorite Book	
8		Favorite Celebrity	
9		Strengths	
10		Recent happy episode	
11		Most interesting class until now	
12		Yourself, 5 years later	
13		Someplace you want to visit	
14		Future dreams	
15		What do you expect from this class?	
(omitted)			
25		Anything	

2.2 Class Introduction Techniques

Think-Pair-Share

Group Size: Pairs

Time on Task: 5-15 minutes

Description: A simple and quick technique. The instructor provides students with a topic and a few minutes to think. Students then pair up with other students and share their thoughts with each other.

Procedure

1. Pose the question to the entire class, and give them a few minutes to think about it on their own.
2. Ask students to pair with another student nearby.
3. Ask students to take turns telling their partner about their thoughts. Student A shares their thoughts with Student B, then Student B shares their thoughts with Student A.

<Related Links>

Active Learning Tips: Group Discussion Episode

<https://youtu.be/QszQMW0f0t4>

Think



Pair



Share

Peer Instruction

Group Size: Small ~ Large

Time on Task: 5-15 Minutes

Description: A teaching technique popularized by Professor Mazur of Harvard University. A topic is provided during class, and students engage in discussions with other students nearby to enhance their comprehension. Using this technique will promote motivation towards participation and an enthusiastic attitude towards learning in students, give them the opportunity to think deeply about issues to help them better acquire and retain knowledge, and instill them with a sense of community.

Procedure

1. Pose a multiple choice question.
2. Have students answer through use of the e-Clicker.
3. Have students discuss with other students nearby.
4. Have students answer the same question one more time.
5. Reveal the answer and provide an explanation.

<Related Links>

Active Learning Tips: e-Clicker episode

<https://youtu.be/heBzkffFt2Y>

Active Learning Tips: Peer Instruction episode

<https://youtu.be/cYARZMfihTw>



Round Robin

Group Size: 4-6

Time on Task: 5-15 Minutes

Description: A brainstorming technique. Students take turns making brief commentaries on a given topic using a word, phrase, or short statement. Beginning with the first speaker, continue to proceed to the next student until all group members have contributed.

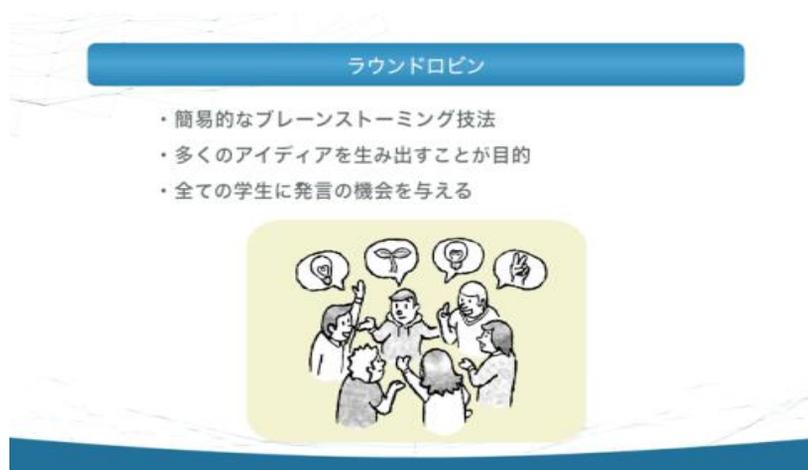
Procedure

1. Ask students to form groups of four to six.
2. Explain that the purpose of this activity is to generate many ideas, and ask students to refrain from evaluating, questioning, or discussing the ideas to prevent interrupting or inhibiting the flow of ideas.
3. Inform students of the time limit if any, then announce the topic.
4. Designate a student to be the first to share their idea, then go around the entire classroom in order until every student has contributed.

<Related Link>

Active Learning Tips: Group Discussion episode

<https://youtu.be/QszQMW0f0t4>



Buzz Group

Group Size: 4-6

Time on Task: 10-15 Minutes

Description: Buzz Groups are teams of four to six students that are formed quickly and extemporaneously to respond to course-related questions. They are effective in serving as a warm-up to whole-class discussion.

Procedure

1. Form groups and announce the discussion prompts and the time limit.
2. Ask group members to exchange ideas in response to the prompts.
3. Ask the students to return to whole-class discussion and restate the prompt to begin.



2.3 Class Development Techniques

Three Step Interview

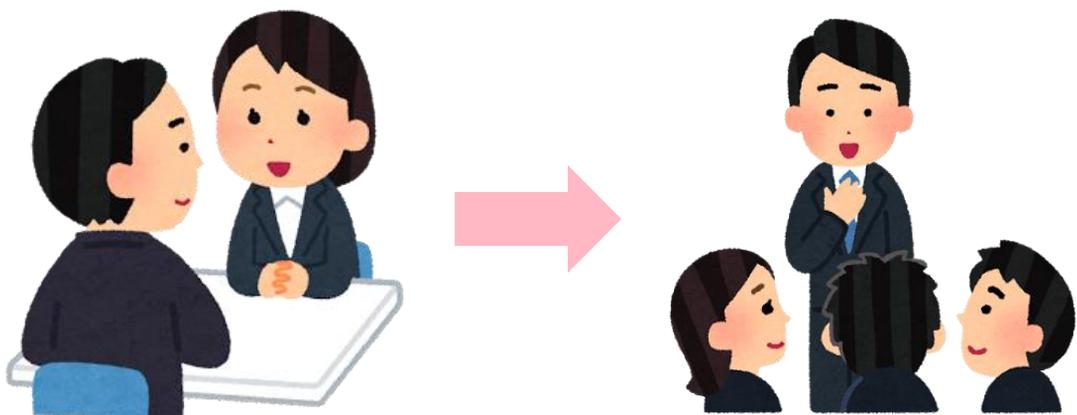
Group Size: 2-4

Time on Task: 15-30 Minutes

Description: In Three-Step Interview, student pairs take turns interviewing each other and then report what they learned to another pair.

Procedure

1. Students divide into groups of four, and quads subdivide in to pairs A-B and C-D.
2. Student A interviews B and student C interviews D for a predetermined time. The interview asks questions, listens, and probes for further information but does not evaluate or respond.
3. Partners reverse roles and interview each other for the same amount of time.
4. Students A and B introduce each other with synthesized summaries of their partner's interview response to Students C and D. Students C and D do the same for Students A and B.



Peer Editing

Group Size: Pair

Time on Task: 2 Hours

Procedure

1. Students work in pairs, taking turns describing ideas for the paper that each individually intends to write. As each student describes his or her ideas, a partner takes notes, asks questions, and makes suggestions.
2. Each student conducts research for the individual paper, keeping an eye open for material that might prove useful to the partner.
3. Students write their papers individually.
4. Within each pair, students exchange paper drafts for peer editing. Student editors make proofing marks and comments directly on the paper and score or rate the paper with a peer review form. Student editors also complete and sign the peer review form, indicating their ratings of each of these elements.
5. Each author revises his or her paper, taking the peer editing into consideration.
6. Authors attach the peer review form to the final draft and submit it to the professor for evaluation.



Collaborative Writing

Group Size: 2-3

Time on Task: Several Hours

Description: In Collaborative Writing, 2 to 3 students work together to write a paper.

Procedure

1. Students form groups of 2 or 3 at your direction or by choosing partners and then generate ideas by brainstorming together or conducting preliminary research.
2. Together, students organize their ideas and create an outline.
3. Students divide up the outline, selecting or assigning sections for each student to write initial drafts individually
4. Teams read first drafts and discuss and resolve any significant disparities in voice, content, and style.
5. Teams combine individual sections into a single document.
6. Teams revise and edit their work, checking for content and clarity as well as grammar, spelling, and punctuation.
7. After the final edit, teams submit their papers to the professor for assessment and evaluation.



Micro-Debate

Group Size: 3

Time on Task: 10-15 Minutes

Description: Micro-Debate is a simplified version of Critical Debate. Its advantage is that it can be conducted in a short amount of time.

Procedure

1. The instructor provides a discussion topic.
2. Students choose one side of the argument, and write down 5 or more arguments supporting that side.
3. Students then assume the opposing position, and write down 5 or more arguments supporting that side.
4. Students form groups of 3 and take turns assuming the role of judge and defenders of the two opposing sides, for a total of 3 debates.

<Related Links>

Active Learning Tips: Group Discussion episode

<https://youtu.be/QszQMW0f0t4>



Critical Debate

Group Size: 4-6, then 8-12

Time on Task: 1-2 Hours

Description: Critical Debate is a technique in which the class is divided into two opposing sides to engage in debate. It is necessary to spend sufficient time selecting a controversial topic in the field with two identifiable, arguable, and opposing sides that are appropriate to debate. If background information is required, students will need to be prepared through research or other methods.

Procedure

1. Propose the topic and ask students to identify which side of the proposition they most support. They can do so by raising their hands or writing their names on a sheet of paper.
2. Explain to students that they will argue the side that is contrary to their own beliefs, stressing the benefits of arguing against their personal views (e.g., it helps them to clarify their own ideas and to deepen their understanding of the issue).
3. Divide students into four- to six- member teams, with half the teams assigned to one side of the argument and the other half assigned to the opposing argument. Try to get as many students as possible arguing for the side they disagree with, realizing that especially with complex issues students will likely not divide evenly. A large group of students who don't know or who gravitate toward a middle position will provide a fair amount of flexibility during group formation.
4. Explain ground rules and give students time to assign roles and organize how they will prepare for and conduct the debate.
5. Give students time to prepare their arguments (e.g., fifteen to thirty minutes).
6. Pair teams representing opposing sides.
7. Announce and allow time to present arguments (e.g., fifteen to thirty minutes).
8. Give teams time to prepare rebuttals (e.g., ten minutes).
9. Announce and allow time to present rebuttals (e.g., five minutes each side, ten minutes total).
10. Hold a whole-class discussion to summarize the important issues and to give students the opportunity to discuss the experience of arguing opinions they do not hold.

Send a Problem

Group Size: 2-4

Time on Task: 30-45 Minutes

Description: Each group receives a problem, tries to solve it, and then passes the problem and solution to a nearby group.

Procedure

1. For groups of two to four students, and take time to describe the activity, give instructions, and answer questions.
2. Distribute a different problem to each group, asking each group to discuss the problem, generate possible solutions, choose the best solution, and record and place their response in the folder or envelope.
3. When time is up, instruct teams to pass to the next group; each group receives a new folder or envelope.
4. Upon receiving new problems, students again brainstorm responses and record results until time is called and they again pass the problem to a new group.
5. Repeat the process for as many times as seems useful and appropriate for the problem.
6. Students in the final group review the responses to the problem, analyze, evaluate, and synthesize the information, adding any additional information they wish.
7. This activity concludes as teams report on the responses contained in the folder they evaluated. As groups report out, add any points that groups missed and reinforce correct processes and solutions.



Case Study

Group Size: 3-6

Time on Task: As appropriate

Description: In this activity, student teams review a written study of a real-life scenario containing a field-related problem situation.

Procedure

1. Form student groups and distribute identical or different cases to each team.
2. Allow time for students to ask questions about the process they are to use to clarify the problem presented in the case.
3. Students work in groups (anywhere from one class session to a few weeks depending on the complexity of the assignment) to study the case in depth from the protagonist's point of view and to become familiar with the issues and decision options.



Structured Problem Solving

Group Size: 4-6

Time on Task: 1-2 Hours

Description: Structured Problem-Solving provides students with a process for solving a complex, content-based problem within a specified time limit.

Procedure

1. First, organize the students in to groups and assign students a complex problem to solve.
2. Ask students to solve the problem using the specific steps you have identified as a problem-solving technique. Here are some examples.
 - a. Identify the problem
 - b. Generate possible solutions
 - c. Evaluate and test the various solutions
 - d. Decide on a mutually acceptable solution
 - e. Implement the solution
 - f. Evaluate the solution
 - g. Ask each group to report their solutions.



Problem?



Solved!

Group Investigation

Group Size: 2-5

Time on Task: Several Hours

Description: In Group Investigation, student groups plan, conduct, and report on in-depth research projects.

Procedure

1. Have students brainstorm potential topics that fit within your parameters.
2. Select the topics for investigation from the list that students have generated. You can make these choices, or you can have students participate in the selection. One method is to type out or write on the whiteboard all of the potential choices and then ask individuals to vote for their top three choices.
3. Form teams based on topic interest.
4. Give teams time to organize their efforts such as preparing a prospectus in which they formulate their research questions, identify goals and the resources they will need to carry out their investigation, choose their methods of investigation, and divide up and assign the tasks.
5. Ask groups to begin their investigation, gathering information, reviewing it, deciding whether more information is needed, and analyzing and interpreting the information.
6. Have groups prepare their final report.



Paper Seminar

Group Size: 4-6

Time on Task: As appropriate

Description: In a Paper Seminar, a student makes a formal presentation of an original paper to a small group of peers.

Procedure

1. Assign students to groups and tell students that they will all be responding formally and informally to peers' papers in their group.
2. Determine who will serve as formal respondent for each paper. For groups of four, assign one formal respondent; for groups of six, consider assigning two formal respondents.
3. Explain to students the time frame and tasks.
4. On the day of the Paper Seminar, give the first presenters time to formally present their papers to their groups, such as five to ten minutes.
5. Give respondents time to respond, such as ten minutes
6. Give groups time to discuss the paper, such as twenty minutes
7. Follow the same sequence of activities for the second presenters and so forth.



2.4 Class Reflection Techniques

Minute Paper

Group Size: Any size

Time on Task: 5-10 Minutes (End of Class)

Description: Distribute these forms every class and have students write about that day's questions, what they learned, how much they understood, etc. and use the collected information towards improving the class. According to Nakai (2015, p.166), "Making students aware of the fact that they are expected to output something at the end of class helps them maintain their concentration. It also measures students' level of understanding and highlights which content needs to be followed up in the next lecture. It can also be used to take roll".

Example of a Minute Paper (Nakai, 2015)

Course Name	Date Year Month Day () Period
Name	Affiliation
Student ID	Year
Question 1 Please write about what you thought was important in today's lecture.	
Question 2 Please write about any questions or things you didn't fully understand about today's lecture.	

Review Sheet

Group Size: Any

Time on Task: 5-10 Minutes

Description: This sheet is a tool for communication between instructors and students regarding the class. Students take a few minutes at the end of class to reflect on that day's lecture or leave comments for the instructor. According to Kogo (2006), this method has been reported to have positive effects such as "promoting attendance, more enthusiastic attitudes in class, building a relationship of trust between instructor and students, better understanding and acquisition of lecture content". A template is available for download at Professor Chiharu Kogo's website. Within Waseda University, it is possible to use this method online using Course N@vi (Kogo, 2007).

Example of a Review Sheet (Based on Kogo, 2006)

担当	科目名	アドレス
学生番号	名刺	ふりがな

月/日	言いたいこと。聞きたいこと。あなたからの伝言板。	あなたへの伝言板
1 /		
2 /		
3 /		

2.5 Assessment Methods

Rubric Assessment

Description: According to Stevens and Levi (2014), Assessment Rubrics separate specific assignments into smaller components, and provide detailed explanations of the levels of each component that satisfy the assessment standards. Assignments can vary from reports, book reviews, and participation in discussions to experiment reports, portfolios, group work, and presentations. Creating the rubric does require some time, but once completed it can also be used for Peer Assessment (Please refer to p.28 for more information). Various types of rubrics can be found online at the Rubric Bank operated by the Japan Association for Educational Development in Higher Education (<https://www.jaedweb.org/blank-3>).

Procedure

1. Set assignments
2. Set assessment scales
3. Set assessment perspectives
4. Set assessment standards

Example of Rubric for Evaluating Reports

Name: Supported Arguments

Prompt: The report provides evidence to support the arguments.

Points	Name	Explanation
0	Not at all	The report does not provide any evidence to support the arguments.
2	Briefly	The report provides some examples for the major arguments throughout the report, but does not include any references.
4	In detail	The report provides examples for each of the major arguments and includes references.

Name: Word Length

Prompt: The report was an appropriate length.

Points	Name	Explanation
0	No	The report was less than 500 words.
1	Briefly	The report was 500 words or more.

Portfolio Assessment

Description: According to Tanaka (2010, p.106), Portfolios are systematic and continuous collections of the evidence of one's efforts, growth, and achievements in relation to learning, in accordance with certain purposes, goals, criteria and standards.

The content of a portfolio are as follows.

1. Works created as a result of learning, or task memos created during the process of learning.
2. Self-assessment by students
3. Records of instruction and assessments by instructors

Using this method, it becomes possible to not only assess the abilities of learners through testing, but also to formatively assess learners' abilities from daily learning.

Recently, e-portfolios which accumulate learner's portfolios on Learning Management Systems are being used.



Peer Assessment

Description: Learners evaluate each other's performance. According to Ueno, Songmuang, Okamoto and Nagaoka (2008), Peer Assessment has the following 7 merits.

- (1) Peer Assessment increases the autonomy of learners, enhancing their motivation to learn.
- (2) Opinions from other people promote introspection by learners more than test scores.
- (3) Through evaluating others, learners can learn from the work of others and engage in more introspection.
- (4) Feedback from other learners who have similar backgrounds are easier to understand.
- (5) It reduces the burden placed on instructors, and promotes useful feedback from learners even when the instructor is not present.
- (6) A variety of feedback becomes available, even some that the instructor may not have considered.
- (7) In the case of adult students, the reliability of assessment scores can be enhanced by having multiple evaluators as opposed to a single instructor.

Using rubrics when making assessments makes it more difficult for mistakes to occur.



3. References

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