A Study on Developing Operational Plans for Implementing Achievement Standards–based Assessment in High Schools

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I. Necessity of the Study

◢ The introduction of Achievement Standards-based Assessment(ASA) to high school general subjects according to the study on strategies for advancement of education management in secondary school

- The Ministry of Education announced plans on strategies for advancement of education management with the introduction of the ASA to meet the demands for the improvement of evaluation methods and the reduction of academic pressure to strengthen creativity and character education as well as to comply with the 2009 revised curriculum. (Dec. 2011)
- The ASA has been applied to first-year middle school students and to specialized subjects for high school students since 2012 and to general subjects for high school students since 2014.
- The ASA is an assessment system that evaluates students according to their levels of achievement based on their goals instead of ranking students based on relative standing.

◢ Need to review main issues related to the introduction of the ASA to high school general subjects and specify assistance plans.

- A management plan to accomplish the purpose of the ASA and to reflect diverse characteristics of high school is needed. The plan might include offering all subjects as elective curriculum except the Korean history and emphasizing various curriculums considering each student's aptitude and career.
- In particular, it is essential to develop appropriate methods for determining achievement levels and application plans for utilizing achievement data as a reliable resource for college admission.

II. Purpose of the Study

◢ Review main issues relevant to the introduction of the ASA to high school general subjects and propose operational plans of ASA appropriate to high school general subjects
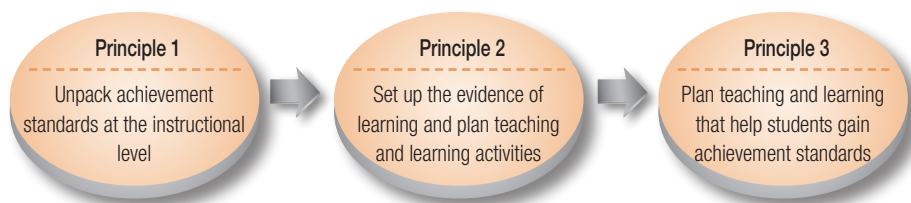
◢ Provide detailed assistance plans from multidirectional perspectives for the stable introduction and application of the ASA to high schools.

III. Contents of the Study

◢ Study on how to design instruction aligned to achievement standards and assessment.

◢ Investigate methods for determining achievement levels.

◢ Propose how to use the results of the ASA as data for college admission.

◢ Provide detailed assistance plans for the internal stability of the ASA in high school.

IV. Results of the Study

◢ Principles of instructional designs considering alignment

• This study suggests principles of instructional designs and action plans to teach students according to the ASA based on Zagranski et al. (2008) and a study conducted by Vermont Department of Education (1999) in the U.S., Ainsworth(2003) and Wiggins & McTighe(2005).

Principle 1	Principle 2	Principle 3
Unpack achievement standards at the instructional level	Set up the evidence of learning and plan teaching and learning activities	Plan teaching and learning that help students gain achievement standards

Figure 1 Principles of ASA Instructional Design Considering Relevance

• To apply the three principles above, this study introduces various instructional designs including Unwrapping Standards, which was designed to make it easy to

apply comprehensive and abstract achievement standards to teaching and assessment ; Backward Design, which helps teacher design teaching and learning based on the evidence of learning and Differentiated Instruction model, which considers students's achievement standards learning maps of achievement.

Table 1	Contents and Questions to be Considered When Designing ASA Instructions	
Stages	**Contents**	**Questions**
Application Plan 1: Set up achievement standards	Write down specific knowledge or skills to know	• What should students know and be able to do after the instruction?
	Relation or hierarchy between knowledges or technologies	• What relation or hierarchy does each knowledge or technology have with one another?
	Big ideas/ Critical questions	• What big ideas should students have and what kinds of critical questions should they be able to answer after the instruction?
Application Plan 2: Set up evidence in the study	Evidence of learning (e.g., answers, results, performance)	• What is the evidence indicating that students have achieved their achievement standards?
	Activities that can draw evidence	• What activities or homework are needed to confirm evidence of learning?
	Characteristics indicating difference in levels	• What characteristics indicate the degree of students' achievement standards?
Application Plan 3: Plan for teaching and learning activities	Variety of students	• How will you check students'preparation for study? • How will you differentiate teaching and learning activities according to students' preparation or achievement levels? • How will you operate groups in a flexible manner?
	Enough learning opportunities to reach achievement standards	• What stages do students go through to reach achievement standards? • Considering the stages, how will you determine the order of teaching and learning activities?
	Formative evaluation to check learning process and give feedback	• What formative evaluation is needed to check students'learning process and provide them with feedback?

■ Results of studying how to set up appropriate achievement standards for high school general subjects

- In ASA, to judge if the learner reaches a certain achievement standard, evaluation criteria, and proportions of achievement standards (cut-off scores to achievement standards) should be established.

- Results of studying how to set up appropriate achievement standards for high school general subjects

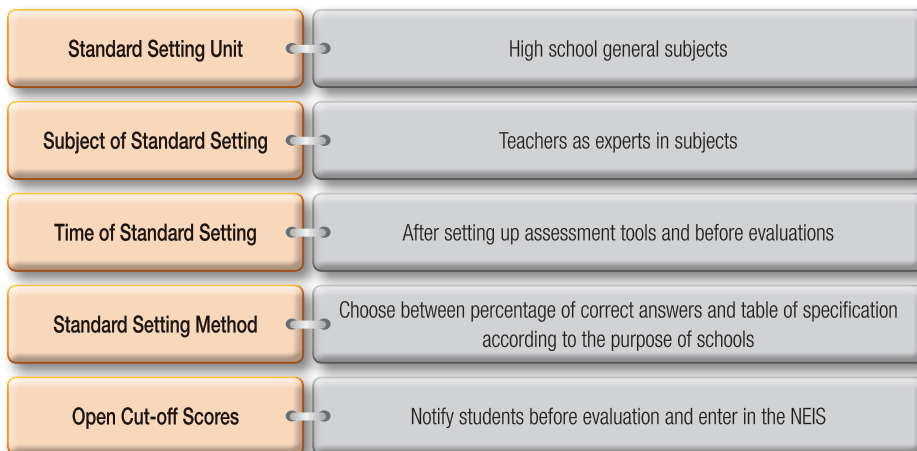| Table 2	Results of Studying How to Set Up Achievement standards for High School General Subjects
Contents	**Results**
Setting the level of the ASA for high school general subjects	• Consider the relation with the 2009 revised curriculum • Improve the validity of evaluation • Offer information to improve teaching and learning • Reflect the characteristics of schools and curriculums
Review the applicability of fixed cut-off scores in middle school	• Lack of the validity of each cut-off score, the proportion of standard achievement • Difficult to reflect the characteristics of schools and curriculums • Difficult to reflect the variety and autonomy of curriculums of unit schools • Difficult to reflect the characteristics of assessment tools and achievement levels • Possibility of ceiling effect
Review how the level of model high schools was set up	• Possible to reflect the characteristics of schools and curriculums • Offer autonomy to the rating system of unit schools • Improve the validity of evaluation • Need to enhance the professionalism of teachers as evaluators

- According to the study of applying a modified Angoff method and Ebel method, the difference in teachers'responses to the proportion of cut-off scores is statistically insignificant.

Results of a Survey on to What Extent Cut-off Scores Reflect Achievement Standards

Standard set-ting	How much cut-off scores reflect achievement standards						x^2 statistical value
	Not at all	To little extent	To some extent	To a moderate extent	To a large extent	Total	
Percentage of correct answers	15(9%)	17(11%)	87(55%)	38(24%)	2(1%)	159	2.9
Table of specification	17(8%)	34(16%)	119(54%)	45(21%)	5(2%)	220	
Total	32(8%)	51(14%)	206(54%)	83(22%)	7(2%)	379	

- In the normative assessment, standards must be set up based on the analysis of assessment tools. This study suggests the unit school method as an alternative, which reflects not only the characteristics of schools and curriculums but also the characteristics of assessment tools and achievement standards.

Standard Setting Unit	High school general subjects
Subject of Standard Setting	Teachers as experts in subjects
Time of Standard Setting	After setting up assessment tools and before evaluations
Standard Setting Method	Choose between percentage of correct answers and table of specification according to the purpose of schools
Open Cut-off Scores	Notify students before evaluation and enter in the NEIS

Figure 2 Achievement Standard Setting For High School General Subjects

◢ Use the results of the ASA as data for college admission

- To use the results of the ASA for college admission, the rating result (achievement level: A-E, in case of physical education and arts class: A-C)and information about achievement standards must be used rather than changing valuation system or rating system.

- This study suggests two rating methods using the ASA according to the purpose of selection.

  - Basic proposal: It considers general achievement standards in high school as a basic requirement for selection and applies the achievement standards of all subjects to evaluations.

| Table 5 | Examples of Calculating Achievement Standard Grades Per Term |

Subjects	Achievement Standards	Achievement Standard Scores	Completion Units	Subject Scores (Achievement Standard Scores × Completion Units)	Achievement Standard Grades per Term
Korean	A	5	5	25	4.8
Math	B	4	5	20	
English	A	5	4	20	
Social Studies	A	5	3	15	
Science	A	5	5	25	
Total	-	24	22	105	

  - A Proposal with additional subjects: After selecting candidates in the first stage based on grades (e.g. above 4.0 in high school), it gives a weighting to specific subjects according to the characteristics of units of recruitment.

Examination Number	First Round of Selection			Second Round of Selection	
	Achievement Standard Grades in High School	Selected		Achievement Standard Grades of Specific Subjects	Selected
001	5.0	O		5.0	O
002	4.8	O		4.6	X
003	3.9	×		-	-
004	4.2	O		4.8	O
…	…	…		…	

Table 6 Examples of Calculating Achievement Standard Grades According to a Proposal with Additional Subjects

V. Policy Proposal

◪ Establish rules regarding how to fill in and manage student Modify rules.

- This study proposes that the methods to evaluate achievement by subject should be changed to include raw scores, the average of subjects (standard deviation), and achievement standards (the number of students taking the classes)
- To offer not only quantitative information but also qualitative information about students'achievement, record detailed information about student achievement of standards.
- To clearly indicate to what degree students achieved their goals, the term "achievement"should be replaced with "achievement standard."

Table 7 The Revised Article 15 on Filling in and Manage Student Records

Current	Revision
④ High schools shall enter curriculums, subjects, units, raw scores/average of subjects (standard deviations), and ranking (the number of students taking the classes) according to Clause 1 at the end of the term. However, in cases of subjects, including agricultural life industry, industry, industrial information, fisheries and shipping, and home economics among specialized subjects, enter curriculums, subjects, units, and raw scores/average of subjects (standard deviations), and achievement (the number of students taking the classes). In case of physical education and arts (music/art) among general subjects, enter curriculums, subjects, and achievement and in the column of specialty, enter brief information about performance, aptitudes, participation or attitudes of students in sentences if necessary.	④ High schools shall enter curriculums, subjects, units, raw scores/average of subjects (standard deviations), and achievement standards(the number of students taking the classes) according to Clause 1 at the end of the term. However, _____ _____ _____ _____ in the column of specialty, enter brief information about performance, aptitudes, participation or attitudes of students, and the characteristics of achievement standards by subject in sentences if necessary.
⑥ In the column of specialty in middle and high school, enter specific abilities, performance evaluations, participation and attitudes of students in sentences if necessary or after-school classes (the names of subjects, and completion units)	⑥ In the column of specialty in middle and high school, enter specific abilities, performance evaluations, the characteristics of achievement standards by subject, participation and attitudes of students in sentences if necessary or after-school classes (the names of subjects, and completion units)
⑦ In the case of cultural subjects among high school general subjects, enter subjects, completion units, and enter "completion"when asked whether the students completed the subject. In the column of specialty, enter information in sentences if necessary.	⑦ In the case of cultural subjects and basic subjects (basic math, basic English) of basic curriculums among high school general subjects, enter subjects, completion units, and enter "P"when asked whether the students completed the subject. Also, in the column of specialty, enter the characteristics of achievement standards by subject, in sentences if necessary. However, if the student failed to complete the subject, do not enter anything in the student record.
⑨ If the number of students who take classes of general subjects (except physical education, arts(music/art), cultural subjects) is fewer than 13 and if the school would like to, the school can enter "·" in the column of ranking. However, if there are more than two subjects, which have fewer than 13 students, enter either "ranking" or "·" in the column of ranking.	⑨ If the number of students who take classes of general subjects (except physical education, arts (music/art), cultural subjects) is fewer than 13, enter curriculums, subjects, units, raw scores / average of subjects (standard deviations), achievement (the number of students taking the classes) and do not enter ranking.

◤ Modify and improve the National Education Information System (NEIS) with the introduction of the ASA to high school general subjects.

- Schools should modify the NEIS with the introduction of the ASA and improve the score statistics system to offer detailed information about achievement levels of students.

	Menu in NEIS	Changes
1	[Calculate Scores by Subject]	The system will allow schools to enter cut-off scores by achievement standards after the set-up of standards by subject. Scores will be automatically calculated by the system.
2	[Check Report Cards at the End of the Term]	The system will display raw scores, achievement standards, the number of students taking the classes, ranking, average of subjects, and standard deviations.
3	[Check Distribution of Scores by Subject]	The system will include the distribution of achievement standard scores and the analysis of questions by achievement standard.

Table 8 Changes in the NEIS with the Introduction of the ASA to High School General Subjects

(Source: Ministry of Education and Science Technology·Korea Education and Research Information Service, 2012, p. 15)

◤ Establish and implement midterm and long-term plans for the stable introduction of the ASA

- Support the ASA by carrying out different projects per each period
- Enhance support to enable unit schools to implement the ASA during a grace period, during which the results of the ASA will not be used for college admission.
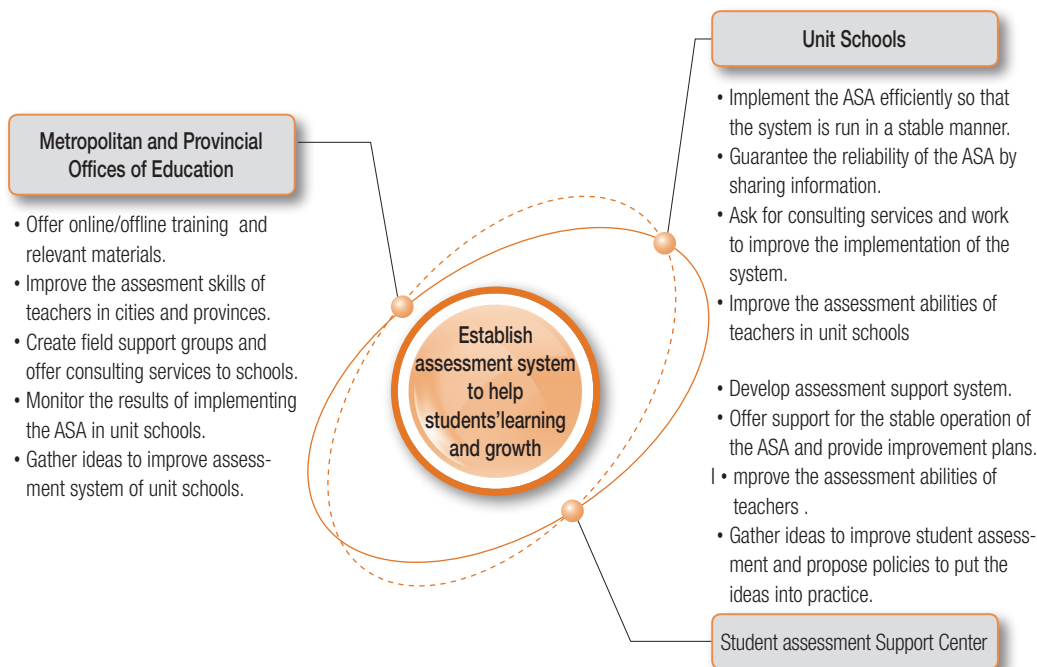
Table 9 Assistance Plans For Each Period For the Internal Stability of the ASA

	Preparation Period for the Introduction (2012-2013)	Introduction Period (2014-2016)	Development Period (2017-2019)
Purpose	• PR for the introduction of the ASA • Improve the recognition and understanding of the ASA	• Improve the understanding and recognition of the ASA • Enhance the reliability of the ASA	• Stabilize the operation of the ASA in unit schools • Improve the reliability of academic records from school and use the results of the ASA for college admission
Practical support for the implementation of the ASA	• Select model schools • Provide teachers with PR materials • Develop data for support - Develop curriculum manuals - Develop materials to improve performance evaluation and descriptive evaluation - Develop achievement standards according to the 2009 revised curriculum - Develop support materials for teaching, learning and evaluation • Create field support groups and enhance consulting capabilities	• Provide students, parents with PR materials • Distribute support materials to a larger group and associate them with teacher support system • Discover cases of schools implementing the system effectively and share their know-how • Improve the capabilities and activities of field support groups • Create the environment in which teachers can concentrate on implementing the ASA - Gradually send assistants who can help teachers do administrative work - Gradually reduce instruction time per teacher and students per class	• Offer detailed support materials • Enhance consulting ability and qualification of field support groups • Develop a system to check achievement levels of students any time • Create the environment in which teachers can concentrate on implementing the ASA - Complete sending assistants who can help teachers do administrative work - Reduce instruction time per teacher and students per class
Improve the professionalism of teachers	• Improve the ability of teachers as evaluators - Understand achievement standards and levels - Enhance performance evaluation and descriptive evaluation • Develop on/offline training programs	• Improve the ability of teachers as evaluators - Improve teaching, learning, and evaluations - Apply the methods of setting achievement standards - Offer feedback and improve learning • Vitalize the activities of councils discussing subjects in unit schools • Make sure teachers have the right to evaluate • Expand online/offline training programs	• Improve the ability of teachers as evaluators - Enhance relations among achievement standards, teaching, learning, and evaluation - Improve feedback and communication with parents • Vitalize the activities of councils and regional groups discussing subjects • Enhance teachers' right to evaluate

	Preparation Period for the Introduction (2012-2013)	Introduction Period (2014-2016)	Development Period (2017-2019)
Establish teacher support system	• Decide the direction of system setting	• Develop system prototypes and test-run • Establish system	• Stabilize the system

◢ Establish Student Assessment Support Center (tentative name) to make sure the effective operation of the ASA

- The center will offer various operation manuals, materials to improve teaching, learning, and assessment, and cases of schools implementing the system effectively to unit schools as well as metropolitan and provincial offices of education.
- The center will monitor the operation of the ASA regularly and make efforts to offer consulting services to targeted schools and to enhance the capabilities of teachers.

Metropolitan and Provincial Offices of Education

- Offer online/offline training and relevant materials.
- Improve the assesment skills of teachers in cities and provinces.
- Create field support groups and offer consulting services to schools.
- Monitor the results of implementing the ASA in unit schools.
- Gather ideas to improve assessment system of unit schools.

Establish assessment system to help students'learning and growth

Unit Schools

- Implement the ASA efficiently so that the system is run in a stable manner.
- Guarantee the reliability of the ASA by sharing information.
- Ask for consulting services and work to improve the implementation of the system.
- Improve the assessment abilities of teachers in unit schools

Student assessment Support Center

- Develop assessment support system.
- Offer support for the stable operation of the ASA and provide improvement plans.
- mprove the assessment abilities of teachers .
- Gather ideas to improve student assessment and propose policies to put the ideas into practice.

Figure 3 Roles of Student Assessment Support Center

VI. Expected Benefits

◢ Improve the understanding of the ASA and create the environment in which student assessment system is operated in a stable manner and academic records are managed efficiently.

◢ Create curriculums fit for the 2009 revised curriculum, create the environment in which teaching, learning, and assessment promote creativity and character education, and improve the quality of education by making sure the purpose of assessment is to improve the capabilities of students and the quality of instructions.

◢ Provide practical assistance so that unit schools can implement the system autonomously by offering plans considering the characteristics of schools and curriculums.