（AEN Project 2005）

ALIVE:
AEN LMS ＆ Contents Interoperability Validation Experiment

March.2006
e-Learning Consortium Japan

3.Implementation of information exchange, etc. regarding interoperability problem, validation system, etc. in each AEN country (AEN LMS & Contents Interoperability Validation Experiment(hereinafter referred to as “ALIVE”)

3.1 Objective and target result

The validation experiment is to be performed of LMS and content products of each AEN country to check the SCORM 1.2 compatibility and interoperability. In addition to the SCORM 2004 compatible products, this year also performs testing of the SCORM 2004 compatible product. The activity in this year is third year, and the ALIVE events have been held three times, following January and December 2004.

3.1.1 Objective

(1) Holding of ALIVE 2005 (information exchange and interoperability experiment between products)
(2) Implementation of SCORM 1.2 standard compatible validation experiment
(3) Implementation of SCORM 2004 standard compatible validation experiment

3.1.2 Target result

(1) Holding of “ALIVE 2005”
- Information exchange regarding each AEN country and interoperability, etc. with ADL
- Implementation of interoperability experiment between each country products

(2) Grasping of interoperability quality compatible to SCORM 1.2 and 2004
- Grasping of compatibility to SCORM standard
- Grasping of interoperability between each country products
- Grasping of SCORM compatibility of authoring tool preparation content

(3) Check of test suite effectiveness, operability, etc.
(4) Preparation of compatibility check standard and supplemental operational instruction of SCORM 2004 test suite

3.2 Activity overview

3.2.1 Participating body and participant

11 persons from 6 countries participated in the validation experiment. Furthermore, 25 persons from 12 countries participated in ALIVE (International

Conference). Table 3-1 shows the participants of validation experiment.

Table 3-1 Participant list

untry name	Name	Organization, etc. belonged	SCORM1.2 Participation	SCORM2004 Participation
rea	Mr. Park Choon Won	ALEXIT	○	
alaysia	Mr. Muhammad Hasan	Multimedia University	○	
ngapore	Mr. Lim Kin Chew	Temasek Polytechnic	○	
	Mr. Daniel Tan	Nanyang Technological University	○	
et Nam	Mr. Nguyen Anh Tuan	NCS	○	
USA	Ms Brooks Jennifer	ADL		○
pan	Mr. Takeshi Kumazawa	Human Science		
	Mr. Shingo Shibata	Compaq	○	○
	Mr. Kiyoshi Nakabayashi	NTT Resonant	○	○
	Mr. Hiroshi Miyauchi	Sangyo Noritsu University		○
	Mr. Minoru Toida	SATT		○
	Mr. Hiroyuki Endo	Rail	○	
Secretariat	Mr. Kenichi Tsuji	NEC		
	Mr. Toshiyuki Kobayashi	e-Leaning Consortium, Japan		
	Mr. Yosuke Yoshimura	- ditto -		
	Mr. Toshio Munemoto	- ditto -		

3.2.2 Progress schedule

Table 3-2 Progress schedule

Work item	April	May	June	July	August	Septeme	October	November	December	January	February	March
・Planning	→	→	→	→								
・Experiment by test suite				→	→	→	→					
・Experiment between products									▲			
・ALIVE holding									▲			
・Preparation of compatibility standard							→	→	→	→	→	
・Activity summery										→	→	→

3.2.3 Activity overview

(1) Overall activity

Domestic committee was held to plan activity program and to implement activity follow. The ALIVE International Conference was held in December to exchange information with each AEN country.

Concerning the interoperability validation experiment of each country product, this year performed the SCORM 2004 compatible products in addition to SCORM 1.2. The experiment methods were 2 types such as compatibility to SCORM standard used ADL test suite and interoperability check between LMS product of each country and content product. For the testing places, the testing used the test suite and the testing of interoperability experiment between products were performed in each country and ALIVE conference room respectively.

Concerning the SCORM 1.2 compatible products, the SCORM compatibility testing for the contents provided by commercial authoring tool was performed. The experiment of authoring tool experiment for the SCORM 2004 was not performed due to no authoring tool product available.

In order to smoothly and steadily perform the compatibility inspection by the test suite regarding the SCORM 2004, the material “SCORM 2004 test suite guide”, etc. was provided.

(2) Domestic committee activity

Table 3-3 Domestic conference overview

Conference name	Date held	Major agenda
First precedent conference	November 2, 2005	・Review of activity program ・Overseas validation experiment
Second precedent conference	November 10, 2005	・Validation experiment of authoring tool ・Domestic validation experiment
Third precedent conference	November 29, 2005	・Implementation of validation experiment between domestic products ・International conference agenda

(3) International conference activity

An event called ALIVE was held in Tokyo in December 14 - 15, 2005 to perform validation experiment, etc. between each country products. The details are described in the sub-section 3.5.

3.3 Validation experiment of SCORM 1.2 standard compatible product

3.3.1 Experiment overview

(1) Experiment purpose and method

With use of the testing participating products, the interoperability inspection used test suite and the interoperability experiment between LMS product and content product were performed. With use of commercial authoring tool that declares the SCORM compliance, the compatibility experiment to the SCORM 1.2 standard was also performed.

Here describes the experiment performed with the test suite. The purposes of this testing are as follows:

- To check the SCORM standard compatibility of the testing participating products,
- To grasp the SCORM compatible level of the experiment participating products, and
- To check effectiveness and operability of the test suite.

The test suite used was Multilanguage compatible test suites (ADL test suite Ver. 1.2.7 and Multilanguage module) that were developed in last year, and the following 2 functions were used:

- SCORM 1.2　LMS runtime environmental compatibility test
- SCORM 1.2　Content package compatibility test

Concerning the interoperability experiment between products, other country content product was run with each country LMS product to test whether it operates properly.

Concerning the authoring tool testing, the compatibility testing by the test suite to the content created using the authoring tool was performed.

(2) Participating product

4 LMS products of 4 organizations from 4 countries were participated in the experiment. Table 3-4 shows the participating body or organization, product name, etc. The authoring tool participating products are described in the sub-section 3.3.4. In order to protect enterprise secret, a fictitious name was used for experiment results, etc. without indicating the product name.

Table 3-4 Participating body (or organization) and product list

Country name	Participating body name	Exmerimenter	LMS		Content	
			Product name	Character code	Product name	Character code
Singapore	Learning Standards Technical Committee, Singapore	Dr. Daniel Tan Mr. Lim Kin Chew	Moodle Version 1.5.2	UTF-8	iT21,Ednovation-Biology, VernierCalipers	UTF-8
Viet Nam	New Century Soft Company	Mr. Tin Nguyen Ba	Trainware	UTF-8	SoftSimulator, iLCBuilder	UTF-8
Malaysia	Multimedia University, Malaysia	Mr.Muhammad Hasan	MMLS (Multimedia Learning System)	UTF-8	digital signal processing, e-Business	ascii
Korea	ALEXIT	Mr. Park Choon Won	LMS-A(*1)	UTF-8	Content A (*1)	UTF-8
Total			4 products		4 products	

(*1) Since these were not scheduled for participating in experiment, they were participated in only between products.

3.3.2 Compatibility experiment by test suite

As the results of experiment used the test suite, 1 failure/product among 3 products of LMS was detected. No failure was detected on 3 content products. The non-conformed product ratio is 17% high (failure: 1 product/6 products). The testing results and the failure detected are shown in Tables 3-5 /3-6 and Table 3-7 respectively.

Table 3-5 LMS experiment results by SCORM 1.2 test suite

Product name	LMS product - A	LMS product - B	LMS product - C
Compatibility	x	○	○
Compatible level	-	LMS-RTE2	LMS-RTE2
Number of failure occurred	1（F-01）	None	None

Table 3-6 Content experiment results by SCORM 1.2 test suite

Product name	Content Product - E	Content product - F	Content product - G
Compatibility	○	○	○
Compatible level	SCO-RTE1	SCO-RTE1-Mandatory	SCO-RTE1-Mandatory
Number of failure occurred	None	None	None

Table 3-7 Failure list by SCORM 1.2 test suite

Order No.	Phenomena, etc.	Cause
F-01	Alarm message for option data model was displayed	SCORM standard Infringement

3.3.3 Validation experiment between LMS and content products

In the experiment with 12 combinations of 4 LMS products and 4 content products, failure occurred in 2 combinations. The failure occurrence ratio is 17% high (2 failures/12 combinations).

Both 2 failures are out of SCORM standard, and failure relating to the SCORM standards did not occur. Furthermore, for the product A, failure was detected in testing by the test suite but not detected in the testing between products. From this result, it can be assumed that the testing items with high inclusion to the standard have been strictly performed. The experiment results and the failures detected are shown in Tables 3-8 and 3-9 respectively.

Table 3-8 Experiment results of interoperability between SCORM 1.2 products

		Content			
		Product - A	Product - B	Product - C	Product - D
LMS	Product - E	-	○	○	○
	Product - F	○	-	○	△ (F-02)
	Product - G	○	○	-	○
	Product - H	○	△(F-03)	○	-

○: run properly

△: run but failure occurred

x: did not run

—: due to same body product, experiment was not performed

Table 3-9 Failure list of interoperability between SCORM 1.2 products

Order No.	Phenomena, etc.	Cause
F-02	Content is not suitably displayed	Failure of out of SCORM standard Failure of encode
F-03	Failure occurred on manifest	Failure of out of SCORM standard

3.3.4 Compatibility experiment of authoring tool product

3.3.4.1 Testing overview

(1) Testing background and purpose

Authoring tool that declares the SCORM 1.2 standard compliance is sold in market. However, up to now day, third party institute did not have an opportunity to check the SCORM standard compatibility and interoperability of the authoring tools. The experiment is to check that the authoring tool complies with the SCORM 1.2 standard and is the product took into account the interoperability by the validation experiment.

(2) Testing method

Using the authoring tool for experiment, the content for inspection is to provide based on specification (*1) designated. Using the Multilanguage compatible test suite, the compatibility inspection of content for inspection provided is to perform. Furthermore, it is to check whether the authoring tool has been developed took into account “Application technology for improvement of SCORM interoperability seen in the case study 1.2 edition” (*2).

*1 Specification that the SCORM function required for compatibility check was specified

*2 Specification for product validation that was provided by the e-Learning Consortium, Japan

3.3.4.2 Experiment results

As the results of 5 products tested, failure of the interoperability in 1 product was detected. Number of sample is small, however failure occurrence ratio is 20% high. Since the SCORM compatibility of authoring tool can be comparatively and easily checked with inspection used the test suite, further utilization of the test suite is desired. Furthermore, if further improvement of the interoperability is planned, establishment of the validation system of authoring tool will be needed.

For the product that failure was detected, the product was improved, resulting in problem resolution after detection of failure. Table 3 -10 shows the experiment participating product. Since these are not scheduled for participating in testing, they were participated in only between products.

Table 3-10 Experiment participating products of authoring tool

No.	Authoring tool product name	Vendor
1	AcademicWare Author (V4.0)	Compaq
2	Epiplex (4.3 SP2)	Cybernet System
3	Internet Navigware material creation kit V8.0	Fujitsu
4	LiveCreator (4)	Rail
5	Xcalat Author V2.0	NTT Resonant

3.3.5 Questionnaire result to experiment participant

The results of questionnaire performed to the experiment participants this time are shown in Table 3-11. This questionnaire was performed to the experiment participants of the SCORM 1.2 and the SCORM 2004.

For the meaning of the validation experiment, all bodies (organizations) replied answered to be meaningful, and continuous experiment is expected in future. While for operability of the test suite, half of them has answered to be difficult to use, and improvement is expected. The utilization method, etc. of the SCORM 2004 test suite is seemed to be a delicate.

Table 3-11 Questionnaire summery results of experiment participants

No.	Item	Answer column
1	Meaning of this validation testing	・Was meaningful: 6 bodies ・Was not meaningful: 0
2	Desires continuous implementation of validation experiment after next year	・Desires: 6 bodies ・Does not desire: 0
3	Effectiveness as SCOR standard compatibility validation of test suite	・Effective: 6 bodies ・Not effective: 0
4	Easy use of test suite	・Easy: 3 bodies ・Not easy: 2 bodies
5	Reason of “Not easy to” to use (multiple answers are possible)	・Check item is many, and it takes a too long time for inspection (2 bodies) ・Due to English message display of test suite, it is difficult to understand (1 body)
6	Opinion and request of test suite (free entry)	・Extreme mental concentration was needed for condition and operation of conformance test of SCORM 2004-LMS
7	Opinion to entire validation experiment	・Inclusion covers most of them, and it is very difficult to create such test specification by participant company ・It will better if test suite can be performed by separating test item on every each theme ・Due to heavy processing during test suite tenting, frequent freezes occurred. (SCORM 2004) ・Some cases do not display SCORM conformant even there is not log error. (SCORM 2004) ・It will be better if Q and A sheet of case by case is available ・Wishes to perform testing for sequencing and navigation

3.3.6 Consideration of experiment result

3.3.6.1 Interoperability quality of each country product and effectiveness of test suite

(1) Interoperability quality of each country product is low

The SCORM testing product non-conformity ratio (number of non-conformity product/number of product tested) that was found with the test suite is 17% high, the failure occurrence ratio between products (number of failure occurrence combination/number of testing combination) that was found with the interoperability experiment between products is also 17% high, and the interoperability quality of each country product is low.

(2) Test suite is effective as SCORM compatibility inspection tool

2 SCORM standard infringed products were detected with the compatibility testing used the test suite. Failure related to the SCORM standard was not detected with the interoperability experiment between products. From this result, the test suite is effective as the compatibility inspection tool.

(3) Grasping of SCORM compatible level

The SCORM compatible level has 3 steps of 1 – 3. The product corresponding to the most-significant level 3 did not exist in these participating products. As for the reason that does not support the most-significant level, problems such as that LMS is development cost increase and that if the content is to be higher level, the operable LMS is restricted, are considered.

The compatible level of LMS product that participated in this time is level 2 for 2 products, while the content is less than level 1.5 for 3 products, and problems of interoperability in the compatible level does not occur between these products. However, in the case the content more than compatible level 2 is implemented with these LMS, problem of the operability may occur.

The following explains compatible level of LMS and content. As shown in Table 3-12, in the case the LMS level is lower than the content level, problem that a part of function of the content will not operate, may occur. Concept of the compatible level is essence of the SCORM 1.2 and does not exist in the SCORM 2004. From this result, the SCORM 2004 is much better than the SCORM 1.2.

Table 3-12 Combination and interoperability of LMS and content level

Content / LMS		Level 1	Level 1.5	Level 2	Level 3
		SCO-RTE1	＋Mandatory	＋Optional	＋Mandatory ＋Optional
Level 1	LMS-RTE1	○	○	x	x
Level 2	LMS-RTE2	○	○	△	△
Level 3	LMS-RTE3	○	○	○	○

○: LMS covers all functions of contents that operate.

△: In the case the option that LMS uses content does not support, appropriate function of content does not operate. Which option is supported or used by LMS and content, depends on specification of each product.

×: Option function that content is using does not operate.

(4) Interoperability quality of authoring tool

As the results that 5 authoring tool products were performed, it was found that 1 product infringed the SCORM standard. The non-conformity ratio is 20% high, and it can be pointed out that the interoperability quality of authoring tool is low. It is desired that commercial authoring tool product that declares the SCORM conformance should be checked the SCORM conformance by the test suite.

3.4 Validation experiment of SCORM 2004 standard compatible product

3.4.1 Experiment overview

(1) Type and method of testing

Subject to the experiment participating products, the interoperability inspection used the test suite and the interoperability experiment between the content products were performed. The test suite which uses for the experiment by the test suite is the ADL test suite Ver. 1.1.3, and the following function was used:

- SCORM 2004 LMS conformance test
- SCORM 2004 content package conformance test

(2) Participating product

3 LMS products and 7 content products from 4 countries were participated in the experiment. Table 3-13 shows the participating bodies and product names. Due to protection of enterprise secret, product names were not indicated in experiment results, etc. but fictitious name.

Table 3-13 Participating body and product list

Country name	Participating body name	Experimenter	LMS product	Content product
			Product name	Product name
Japan	Compaq	Mr. Shingo Shibata	AcademicWare	InfomationTechnology-skillCheck
	NTT Resonant	Mr. Yoichi Kosaka	Open Source LMS	-
	Sangyo Noritsu University	Mr. Hiroshi Miyauchi	-	test2.zip
	AEN-WG1	Toida member	-	Baseball
Korea	ALEX IT	Mr. Park Choonwon	NetCampus21	TestContents
Singapore	Temasek Polytechnic	Mr. Lim Kin Chew		Content -C (*1)
USA	ADL	Ms. Jennifer Brooks	-	ADL test content-A (*1)
			-	ADL test content –B (*1)
Total			3 products	7 products

(*1) Since these were not scheduled for participating in experiment, they were participated in only between products.

3.4.2 Compatibility experiment by test suite

As the result of experiment that the test suite was used, failure of 1 of 5 content products was detected. The failed product ratio is 25% (2 failed products/8 products) high. The experiment result and failure are shown in Tables 3-14, 3-15 and 3-16 respectively.

Table 3-14 Experiment result of LMS by SCORM 2004 test suite

Product name	LMS product - I	LMS product - J	LMS product - K
Compatibility	○	x	○
Number of problem occurred	None	1 (F-04)	None

Table 3-15 Testing result of content by SCORM 2004 test suite

Product name	Product - L	Product - M	Product - N	Product - P	Product - Q
Compatibility	x	○	○	○	○
Number of problem occurred	1 (F-05)	None	None	None	None

Table 3-16 Failure list by SCORM 2004 test suite

Order No.	Phenomena, etc.	Cause
F-04	Proper value cannot be obtained with Get Value	SCORM standard infringement
F-05	SCO does not skip properly	SCORM standard infringement

3.4.3 Interoperability validation experiment between LMS and content products

In 15 combination experiment of 3 LMS products and 7 content products of 15 combinations, problem occurred in 2 combinations. The failure occurrence ratio is 13 % (2 failures/15 combinations) high. Both 2 combinations are out of SCORM standard, and any problem related to the SCORM standard did not occur. Concerning the product that failure was detected with the testing of the test suite, this experiment was performed using the product with failure corrected. As the result, any failure related the SCORM standard did not occur, and it can be said that failure detection performance of the test suite is high. Tables 3-17 and 18 show the experiment result and failure content.

Table 3-17　Experiment result of interoperability between SCORM 2004 products

		Content						
		Product-L	Product-M	Product-N	Product-P	Product-Q	Product-R	Product-S
LMS	Product-I	○	○	○	○	○	○	○
	Product-J	○	△(F-06)	○	△(F-07)	○	—	—
	Product-K	○	○	○	—	—	—	—

○:Operated properly

△:Operate but problem occurred

x : Did not operate

- : Not tested

Table 3-18　Failure list of interoperability between SCORM 2004 products

Order No.	Phenomena, etc.	Cause
F-06	Partial link error was observed in concerned content	Problem of out of SCORM standard. Under investigation
F-07	In the interoperability experiment, apostrophe (‘) was in the file name. Failure occurred when concerned content was imported	Problem of out of SCORM standard. Under investigation

3.4.4　Preparation of SCORM 2004 test suite guide, etc.

3.4.4.1 Preparation purpose

For the SCORM 2004 test suite, various information can be obtained from the ADL web site, however the following problems exist for actual utilization:

- Description regarding compatibility inspection condition, method and others is not sufficient. There is problem in the simple sequence inspection of content.
- Corresponding method and cause search method at trouble occurrence are not described.
- The test know-how of efficient testing method is not described.
- Due to English inscription, it is difficult to understand (Content inspection with many users especially becomes problem)

In order to resolve and avoid the above problems, the following 3 documents were provided:

- SCORM 2004 test suite guide
- LMS inspection guide by SCORM 2004 test suite
- Content inspection case sheet by SCORM 2004 test suite

3.4.4.2　Preparation content

(1) SCORM 2004 test suite guide

These documents were provided as concrete guides for using the test suite

regarding the procedure from install of the test suite to test execution, point of cause investigation in the case error occurred and others. The following shows the contents:

1 Test suite overview
- 1-1 How to obtain test suite
- 1-2 Operation environment of test suite
- 1-3 Install procedure of test suite
  - 1-3-1 Install of Java software
  - 1-3-2 Install of test suite
- 1-4 Other setting

2 compatibility inspection
- 2-1 Operational procedure of LMS compatibility inspection
  - 2-1-1 LMS compatibility inspection
- 2-2 Operational procedure of content compatibility inspection
  - 2-2-1 Content package compatible inspection
  - 2-2-2 SCO runtime compatible testing
  - 2-2-3 Metadata compatible testing
  - 2-2-4 Manifest compatible testing
- 2-3 Inspection results
  - 2-3-1 Icon explanation of test log
  - 2-3-2 LMS compatible matrix
  - 2-3-3 Content package compatible matrix
  - 2-3-4 SCO compatible matrix
  - 2-3-5 Metadata compatible matrix

(2) LMS inspection guide by SCORM 2004 test suite

This document was provided as the LMS inspection document, and is the guide for ADL document ”SCORM Conformance Requirements Version 1.3”. The document describes the test content of simple sequence function that was added by SCORM 2004 in details. Since the originals only describes imsmanifest setting and SCO operation, the detailed sequence (why does it operate like so?) is unknown, and it made cause investigation easy at trouble occurrence by describing in the detailed explanation of sequencing. This contents are the same as the contents of ADL document.

(3) Content inspection case sheet by SCORM 2004 test suite

This document was provided as the guide for content inspection. The inspection cases regarding the various types of content that the sequencing was used, were stated. By using the content type (template) described in

“Practical guide for content developer”, the inspection method on every each content type was concretely stated. The following shows the contents:

1 Preface
2 Case of single SCO (template1, template 2 and template 3)
3 Case of multiple SCO (Template 4)
4 Case of having common learning target in multiple SCO (template 5 and template 6)
5 Case of having interim node activity in multiple SCO (template 7 and template 8)
6 Case of that multiple distribution used common learning target was set (template 9)
7 Case of that common learning target is referred from SCO and is written (Template10)

3.4.5 Consideration of experiment result

3.4.5.1 Interoperability quality of each country product

The interoperability quality of each country product is not high. The failure ratio (number of non-conformed products/number of products tested) of the SCORM testing product found with the compatibility testing of test suite, is 25%. The failure ratio (number of failure occurred combination/number of combination tested) between products found with the interoperability experiment is also 13% high, and the interoperability quality of each country product is low.

3.4.5.2 Effectiveness and operability of test suite

(1) The test suite is effective as the compatibility inspection tool.
2 infringed SCORM standard products were detected with the compatibility testing used the test suite. While, failure related to the SCORM standard was not detected in the interoperability experiment between products. From this result, it can be said that the test suite is effective as the compatibility inspection tool.

(2) Operability, etc. of test suite

(a) Time required for testing
The time required for LMS testing is at least 4 hours in the all item (59 items) testing. Testing every each test item is required before entire testing, and it will therefore take many hours for testing. Furthermore, since the identification whether such cause is product failure or freeze is difficult when trouble occurs, it will take more time.

(b) High performance PC is required for testing
Since the log information of inspection result is approximate 20MB which is high, it takes a time for processing and frequent freeze occurs. It is seemed that the cause of freeze will be time over of browser. Using the high performance PC is desired for inspection as freeze countermeasure.

(c) Know-how of testing execution
Through this validation experiment, the following execution know-how was found:

- Browser should shut down every each 1 testing item completion. The number of testing items is 59.
- Every each 1 testing item should be certainly performed. Continuous

execution should not be performed.
・In order to obtain the conformance, all through testing is required.

3.5 Holding of ALIVE 2005

3.5.1 Conference overview

The International Conference Alive 2005 was held in Tokyo in December 14 and 15 , 2005. The participants were 14 from 11 overseas countries and 11 from Japan. Ms. Brooks who is a person in charge of Co-Lab and visited from ADL participated in the conference, and addressed comments to each country opinion. Major implementation contents are the interoperability experiment between products and information exchange. Tables 3-19 and 3-20 show the participants and agenda.

Table 3-19 Participant list

Country name	Name	Body belongs to
Cambodia	Mr. Sok Tha	Ministry of Education, Youth and Sport
Indonesia	Mr. Binsar Siagian	Technical Education Development Center
China	Mr.Ronghuai HUANG	Beijing Normal University
Korea	Mr.Ju Hyung Lee	Dunet Inc.
	Mr.ChoonWon Park	AlexIT Cp.,Ltd
Laos	Ms.Khampheng Phathadavong	Sengsavanh College
Malaysia	Mr. David Asirvatham	Multimedia University
	Mr. Muhammad Hasan	Multimedia University
Philippine	Prof. Rufino Mananghaya	Philippine e-learning Society
	Dr. Benito Teehankee	Philippine e-Learning Society
Singapore	Mr. Lim Kin Chew	Learning Standards Technical Committee
Thailand	Dr.Niracharapha hongdhamachart	MICT
Viet Nam	Mr.Tin Nguyen Ba	New Century Soft Company
USA	Ms Jennifer Brooks	Alexandria ADL Co-Laboratory
Japan	Takeshi Kumazawa	Human Science
	Kiyoshi Nakabayashi	NTT Resonant
	Yoichi Kosaka	NTT Resonant
	Hiroshi Miyauchi	Sangyo Notitsu University
	Shingo Shibata	Compaq
	Tooru Nakajima	- ditto -
	Jun hua Ruan	- ditto -
Secretariat	Ken-ichi Tsuji, Toshiyuki Kobayashi, Yosuke Yoshimura, Toshio Munemoto	e-Leaning Consortium, Japan

Table 3-20 Agenda

Date and time		<Implementation content>
Dec. 14	14:00-14:30	Explanation of schedule, experiment procedure, etc.
	14:30-15:00	Recovery and distribution of experiment content
	15:00-18:00	Experiment implementation
Dec. 15	9:00-9:30	Addressing preparation
	9:30-11:00	Addressing of experiment result
	11:00-11:20	Summery of experiment result
	11:20-12:00	Opinion exchange

3.5.2 Information exchange content

Table 3-21

Speaker（country name）	Opinion exchange content
Ms Brooks (USA)	・SCORM 2004 is also propagating in the United State. The Department of Defense recommends to introduce SCORM 2004. ・The number validation of LMS of SCORM 2004 is 14 products. ・SCORM 2004 test suite has not been changed except for simple sequence. ・I'm pleased to have heard yesterday and today presentation and to have observed the situation that the testing was comparatively successful. ・Various problems existed on LMS, however this is very complex and is not easy. ・There are many problems, however I would like to evaluate aggressive activity by each country. ・Since SCORM 2004 is extremely complex, an important thing is that each country should emphasize to tackle with it.
Mr. Lim Kim Chew (Singapore) **Ms Brooks**	・When is SCORM 2004 completed? 2 years or 5 years later? ・Currently, I cannot say in details since content is not fixed, however it is an important to aim at completion by continuous effort in future. ・Corresponding to needs between communities, making an effort and achieving are important.
Mr. Hasan (Malaysia) **Ms Brooks (USA)**	・What do you think of Sequencing? ・We need to debate terminology issue in future. ・Since Sequencing has relation with LMS, it is necessary to consider such point.

Mr. Lim Kim Chew (Singapore)	・Instruction design is creating various problems. We can understand the value, but….. ・Advanced countries have strong will for progress, however developing countries do not unfortunately have such behavior, and does not especially care about progress.
Ms Brooks (USA)	・SCORM 2004 needs further authoring tool regarding collaboration of instruction design and program.
Mr. Hasan (Malaysia)	・Many points of instruction tool are not known. Due to this, is there much easier tool for designer? ・I also agree with it. I think such manual will be needed immediately.
Ms Brooks (USA)	・I think it is true that was checked with SCORM. Especially in the developing countries……. ・However, I think SSP is very effective. ・For element, I think further challenge is needed. ・Similar thing can be said for LMS.
Dr. Benito (Indonesia)	・SCORM tool of ADL is extremely expensive.
Ms Brooks (USA)	・The US government realizes such issue, and is making an effort for cost down.
Dr. Benito (Indonesia)	・When looking at the ADL website, there are so many agreement items, and it is therefore extremely restricted. ・Why do you choose SCORM? I do not understand the reason. ・What is the strategy? Is it business or education?
Prof. Ruffin (Philippine)	・Since we have not challenged in earnest, we have no idea of the meaningfulness. Are tool, etc. needed?
Ms Brooks (USA)	・I think tool is needed. Tool is helpful, and it is useful for e-Learning.
Dr. Benito (Indonesai)	・I think we should choose SCORM for Asian countries. ・I do not think other countries purchase special SCORM.
Mr. Lim Kim Chew (Singapore)	・Any countries will not choose complicated SCORM. Especially, certificate certifying the compatibility will be needed.
Dr. Benito (Indonesia)	・If you have certificate, you can sell it as product, however if not, you cannot sell it. This is my past experience. ・Speaking of Korean presentation, I understand such SCORM development needs US$6 million, but who pays such large amount?
Mr. Park (Korea)	・Since e-Learning can be useful for business, government will support it.
Ms Brooks (USA)	・If standard is used, it will contribute to normal cost down.
Dr. Benito (Indonesia)	・Anyway, we have many experiences of SCORM ・I think SCORM has surely effectiveness.
Mr. Tsuji (Japan)	・Client has not inquired about SCORM 2004. ・What are you thinking of future ADL challenge? ・Why has not SCORM been propagated?
Ms Brooks (USA)	・Presently, we are reviewing SCORM 2004, and we are under status of trial and error. ・In addition, since 2004 will be reviewed every 2 - 3 years, change of technology is tough work.

3.6 Summery of activity result

3.6.1 Activity result

(1) Interoperability quality of each country product

The SCORM testing product non-conformance ratio (number of non-conformed products/number of product tested) of the SCORM 1.2 products of each AEN country and the SCORM 2004 compatible products are 17% and 25% respectively, and the compatibility to the SCORM standard is low. It is mandatory that the compatibility testing shall be aggressively performed with the test suite to increase the compatibility.

As the result of interoperability experiment between products, 4 troubles (2 troubles of SCORM 1.2 product and 2 troubles of SCORM 2004 products) arisen from problem of out of SCORM standard were detected. In order to improve the interoperability quality, it is also necessary to correspond with problems of out of SCORM standard. eLC has already stated and announced the know-how regarding the interoperability trouble found with questionnaire surveillance, etc. in the “Application technology of SCORM interoperability improvement seen in case study” document, regardless of within or out of the SCORM standard. According to the questionnaire surveillance, the number of interoperability problem occurrence has been decreasing every year, and it is seemed that effectiveness has been proved.

(2) Interoperability quality of authoring tool product

For 5 commercial authoring tool products that declare SCORM 1.2 compliance, the SCORM compatibility testing was performed, and it was found that 1 product was SCORM standard infringement. For the authoring tool, it is also necessary to perform the compatibility inspection by the test suite. Furthermore, if further improvement of the interoperability is aimed at, Establishment of the validation system for authoring tool is desired.

(3) Effectiveness and operability of test suite

It was found that the test suite is extremely effective as inspection tool. 3 products of compatibility infringed products were found with this validation experiment. Failure related to the SCORM standard of the products without compatibility infringement in the interoperability experiment between products did not occur even in the interoperability experiment between products.

It was found that the test suite for SCORM 2004 has problem on operability, etc. As the countermeasure, the “SCORM 2004 test suite guide”, etc. were provided.

(4) Preparation of “SCORM 2004 test suite guide”, etc.

Documents being supplied by ADL are insufficient description for test condition, method of the test suite and countermeasure at failure occurrence, resulting in inspection hindrance. As the countermeasure, 3 types of document such as “SCORM 2004 test suite guide”, “LMS inspection guide by SCORM 2004 test suite” and “Content inspection case guide by SCORM 2004 test suite” were provided. In order to effectively use the test suite, this book is considered to be mandatory.

(5) Information exchange with each country and ADL

It was found that each AEN country is aggressively introducing SCORM. While, it was also found that there are argument opinion regarding effectiveness and its scope of the SCORM standard. Ms Brooks of ADL advised us of each country opinion.

3.6.2 Future issue

(1) SCORM compatibility improvement of product by utilization promotion of test suite

As the result of this validation experiment, it might be possibility that the SCORM compatible product that fringes to the SCORM standard is available in the market. It is therefore necessary to promote interoperability improvement activity for utilization, etc. of the test suite.

(2) Continuous implementation of ALIVE

Many participants desire the interoperability experiment between each country products and continuous implementation of information exchange regarding SCORM standard and the interoperability.