



# IMS Question and Test Interoperability: Results Reporting Best Practice & Implementation Guide

## Version 1.2 Final Specification

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Document Name: IMS Question and Test Interoperability: Results Reporting Best Practice & Implementation Guide

Date: 11 February 2002

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# 1. Introduction

## 1.1 Question & Test Interoperability Overview

The IMS Question & Test Interoperability (QTI) specification describes a basic structure for the representation of question (item) and test (assessment) data and their corresponding results reports [QTI, 02i]. Therefore, the specification enables the exchange of this item, assessment and results data between Learning Management Systems, as well as content authors and, content libraries and collections. The IMS QTI specification is defined in XML to promote the widest possible adoption. XML is a powerful, flexible, industry standard mark-up language used to encode data models for Internet-enabled and distributed applications. The IMS QTI specification is extensible and customizable to permit immediate adoption, even in specialized or proprietary systems. Leading suppliers and consumers of learning products, services and content contributed time and expertise to produce this final specification. The IMS QTI specification, like all IMS specifications, does not limit product designs by specifying user interfaces, pedagogical paradigms, or establishing technology or policies that constrain innovation, interoperability, or reuse.

This document is intended to provide vendors with an overall understanding of the results reporting specification, the relationship of this specification with other IMS specifications (including the IMS QTI ASI), and a best practices guide derived from experiences of those using the specification. Example results reports are included along with a demonstration of how SCORMv1.2 results reporting can be supported. The Best Practices & Implementation Guide also includes a significant number of actual examples that describe how vendors can make the best use of the results reporting specification. These examples are also useful as a starting template for each of the different forms of results report. A full glossary of the XML structure used throughout the specification is also supplied.

## 1.2 Scope & Context

This document is the IMS Question & Test Interoperability: Results Reporting Best Practice & Implementation Guide V1.2 Public Draft Specification. As such it is used in conjunction with the following documents:

- IMS QTI: Results Reporting Information Model v1.2 [QTI, 02d];
- IMS QTI: Results Reporting XML Binding v1.2 [QTI, 02e].

This requirement has been derived from the agreed IMS Q&TI V1.x Scoping document [QTI, 00].

## 1.3 Structure of this Document

The structure of this document is:

- |  |   |
|--|---|
| 2. Relationship to Other Specifications                  | The relationship of this specification activity to other IMS and external specification activities;                 |
| 3. Overall Data Model                                    | A brief summary of the IMS Question & Test Interoperability results reporting information model;                    |
| 4. Basic Examples  | Examples of the basic results reporting that are supported by this specification;                                   |
| 5. Advanced Examples                                     | Examples of the advanced results reporting supported by this specification;   |
| 6. QTI Results Reports and Other Relevant Specifications | The ways in which the IMS QTI Results Reporting specification is used in conjunction with the other specifications; |
| 7. Implementation Guidance                               | Tips on how the distributed learning engines can make best usage of the IMS Q&TI results reporting specification;   |
| 8. Proprietary Extensions                                | Usage of the extensions facilities to support proprietary requirements;   |
| 9. V1.x/V2.0 Issues & Compatibility                      | The initial scoping of the version 1.x specifications and IMS's commitment to backwards compatibility;              |

10. Conformance	The expectations on systems that claim conformance to the IMS QTI results reporting specifications;
Appendix A – DTDs & XSDs	The range of available IMS QTI results reporting DTDs and XSDs;
Appendix B – Glossary of Terms	A glossary of the key terms and elements used within the specification.
Appendix C – Examples Information	Specific descriptive information about the QTI results reporting example files.

## 1.4 Nomenclature

ADL	Advanced Distributed Learning
AMS	Assessment Management System
API	Application Programming Interface
ASI	Assessment, Section, Item
CBT	Computer Based Training
CMI	Content Management Interface
DTD	Document Type Definition
LMS	Learning Management System
QTI	Question & Test Interoperability
SCORM	Shareable Content Object Reference Model
VLE	Virtual Learning Environment
W3C	World Wide Web Consortium
XML	Extensible Mark-up Language
XSD	XML Schema

## 1.5 References

- [CP, 01a] *IMS Content Packaging Information Model*, T.Anderson, M.McKell, A.Cooper and W.Young, C.Moffatt, Version 1.1.2, IMS, August 2001.
- [CP, 01b] *IMS Content Packaging XML Binding*, T.Anderson, M.McKell, A.Cooper and W.Young, C.Moffatt, Version 1.1.2, IMS, August 2001.
- [CP, 01c] *IMS Content Packaging Best Practice and Implementation Guide*, T.Anderson, M.McKell, A.Cooper and W.Young, C.Moffatt, Version 1.1.2, IMS, August 2001.
- [IMS, 01a] *IMS Persistent Location-independent Resource Identifier Implementation Handbook*, V1.0, M.McKell, IMS Specification, May, 2001.
- [IMS, 01b] *Using the IMS Content Packaging to Package Instances of LIP and Other IMS Specifications Implementation Handbook*, V1.0, B.Olivier and M.McKell, IMS Specifications, August 2001.
- [LIP, 01a] *IMS Learner Information Package Information Model*, R.Robson, C.Smythe and F.Tansey, Version 1.0, IMS, March 2001.
- [LIP, 01b] *IMS Learner Information Package XML Binding Final Specification*, R.Robson, C.Smythe and F.Tansey, Version 1.0, IMS, March 2001.
- [LIP, 01c] *IMS Learner Information Package Best Practices & Implementation Guide Final Specification*, R.Robson, C.Smythe and F.Tansey, Version 1.0, IMS, March 2001.
- [MD, 01a] *IMS Learning Resource Meta-data Information Model*, T.Anderson and M.McKell, Version 1.2.1, IMS, August 2001.
- [MD, 01b] *IMS Learning Resource Meta-data XML Binding*, T.Anderson and M.McKell, Version 1.2.1, IMS, August 2001.

- [MD, 01c] *IMS Learning Meta-data Best Practice and Implementation Guide*, T.Anderson and M.McKell, Version 1.2.1, IMS, August 2001.
- [QTI, 00] *IMS Question & Test Interoperability Version 1.x Scoping Statement*, C.Smythe and E.Shepherd, Version 1.0, IMS, November 2000.
- [QTI, 02a] *IMS Question & Test Interoperability ASI Information Model Specification*, C.Smythe, E.Shepherd, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02b] *IMS Question & Test Interoperability: ASI XML Binding Specification*, C.Smythe, E.Shepherd, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02c] *IMS Question & Test Interoperability: ASI Best Practice & Implementation Guide*, C.Smythe, E.Shepherd, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02d] *IMS Question & Test Interoperability: ASI Outcomes Processing Specification*, C.Smythe, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02e] *IMS Question & Test Interoperability: ASI Selection & Ordering Specification*, C.Smythe, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02f] *IMS Question & Test Interoperability: Results Reporting Information Model*, C.Smythe, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.
- [QTI, 02g] *IMS Question & Test Interoperability: Results Reporting XML Binding*, C.Smythe, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002
- [QTI, 02h] *IMS Question & Test Interoperability: QTILite Specification*, C.Smythe, E.Shepherd, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002
- [QTI, 02i] *IMS Question & Test Interoperability: An Overview*, C.Smythe, E.Shepherd, L.Brewer and S.Lay, Final Specification, Version 1.2, IMS, February 2002.

## 2. Relationship to Other Specifications

### 2.1 IMS Specifications

Version 1.2 of the IMS Question & Test Interoperability specification is made up of ten documents:

- a) “IMS Question & Test Interoperability: An Overview – Version 1.2.  
This document describes the overall structure of the IMS QTI specification. It explains the relationship between the different parts of the specification;
- b) “IMS Question & Test Interoperability: ASI Information Model Specification – Version 1.2.  
This document describes the data structures that are used to provide interoperability of on-line distributed learning question and test systems;
- c) “IMS Question & Test Interoperability: ASI XML Binding Specification – Version 1.2.  
This document describes how to encode the Question & Test Interoperability objects in XML and provides the corresponding XML Schema, and DTD;
- d) “IMS Question & Test Interoperability: ASI Best Practice & Implementation Guide – Version 1.2.  
This document provides an overview and describes how the IMS Question & Test Interoperability Information Model and XML Binding specifications can be applied to specific types of interoperability scenarios;
- e) “IMS Question & Test Interoperability: ASI Outcomes Processing – Version 1.2.  
This document describes how outcomes processing for Sections and Assessments is supported within the IMS Question & Test Interoperability framework;
- f) “IMS Question & Test Interoperability: ASI Selection & Ordering – Version 1.2.  
This document describes how the selection and ordering of Items and Sections is supported within the IMS Question & Test Interoperability framework;
- g) “IMS Question & Test Interoperability: Results Reporting Information Model Specification – Version 1.2.  
This document describes the data structures that are used to provide results reporting interoperability for on-line distributed learning question and test systems;
- h) “IMS Question & Test Interoperability: Results Reporting XML Binding Specification – Version 1.2.  
This document describes how to encode the Question & Test Interoperability results reporting objects in XML and provides the corresponding XML Schema, and DTD;
- i) “IMS Question & Test Interoperability: Results Reporting Best Practice & Implementation Guide – Version 1.2.  
This document (the one you are reading now) provides an overview and describes how the IMS Question & Test Interoperability Results Reporting Information Model and XML Binding specifications can be applied to specific types of interoperability scenarios;
- j) IMS Question & Test Interoperability: QTILite Specification – Version 1.2.  
This document describes the QTILite Specification data model, XML binding, and best practice and implementation guidance.

The IMS Question & Test Interoperability specification is related to several other IMS specifications, both complete and in progress. This specification is intended to be consistent with these other initiatives wherever possible, in order to reduce redundancy and confusion between specifications. The related specifications are:

- IMS Meta-data Specification – the IMS QTI specification shares a number of common data object elements with the IMS Meta-data specification. A set of unique meta-data extensions are also used and these are defined within the IMS QTI specifications themselves;
- IMS Content Packaging Specification – the IMS QTI data model is a subset of the Content Packaging data model i.e. IMS QTI Assessments, Sections and Items are defined as content and their XML can be inserted into a Content Packaging instance;

- IMS Learner Information Packaging Specification – this specification adopts some of the Assessment information to construct results records;
- IMS Sequencing Specification V1.0 – this specification is an extension of the IMS Content Packaging specification to control the way in which the sequencing of the associated content [Seq, 02].

## 2.2 Related Specifications

### 2.2.1 IEEE P1484

The IEEE Learning Technology Standardization Committee P1484 is the only body engaged in the educational domain, which has a recognized formal standing. Given the diversity of the fora represented by the participants in the IEEE, there exist a large number of working groups focused on specific activities, as well as more horizontal activities (such as the Architecture and Reference Model and the Glossary working groups) that attempt to tie the other work together. None of the current IEEE working groups and study groups (note a study group is formed to do preliminary work to scope any subsequent working group in the particular area) is focussed on Question & Test Interoperability.

### 2.2.2 Advanced Distributed Learning (ADL) Initiative

ADL is a US military programme started by the White House in 1997 that aims to advance the use of state-of-the-art online training amongst the countries defence forces. There is some collaboration with experts in military training applications from other NATO countries. ADL is very focused on content for particular areas of training. It also has the Shareable Content Object Reference Model (SCORM v1.2) as its working architecture to encourage discussion and input on the emerging standards. Again no separate Question & Test Interoperability specification development is underway and the IMS QTI specification is being considered for adoption in later versions of the SCORM i.e. SCORM v1.4.

### 2.2.3 Aviation Industry CBT Committee (AICC)

The Aviation Industry CBT Committee is a membership-based international forum that develops recommendations on interoperable learning technology, principally for the commercial aviation and related industries. As such its members include both plane and equipment manufacturers, carriers, software and multimedia vendors and a growing number of interested parties not directly engaged in the sector, but nevertheless interested in the work being undertaken. A sub-group of the AICC has worked with the ADL and other organizations from the IEEE LTSC. The IMS Q&TI specifications have been presented to the AICC.

### 2.2.4 ISO/IEC JTC1/SC36 Learning Technology

As of 10<sup>th</sup> November 1999, the ISO/IEC Joint Technical Committee 1 meeting in Seoul agreed resolution 6, which brought into existence Sub-Committee 36 - Learning Technology. The international secretariat for SC36 is provided by the US National Body: the American National Standards Institute (ANSI). ISO/IEC JTC1/SC36 is intended to address standardization in the area of information technologies that support automation for learners, learning institutions, and learning resources. It is the intention that SC36 shall not create standards or technical reports that define educational standards, cultural conventions, learning objectives, or specific learning content. Their activity in the field of question and test has yet to be defined.



## 3. Overall Data Model

### 3.1 Summary Reporting

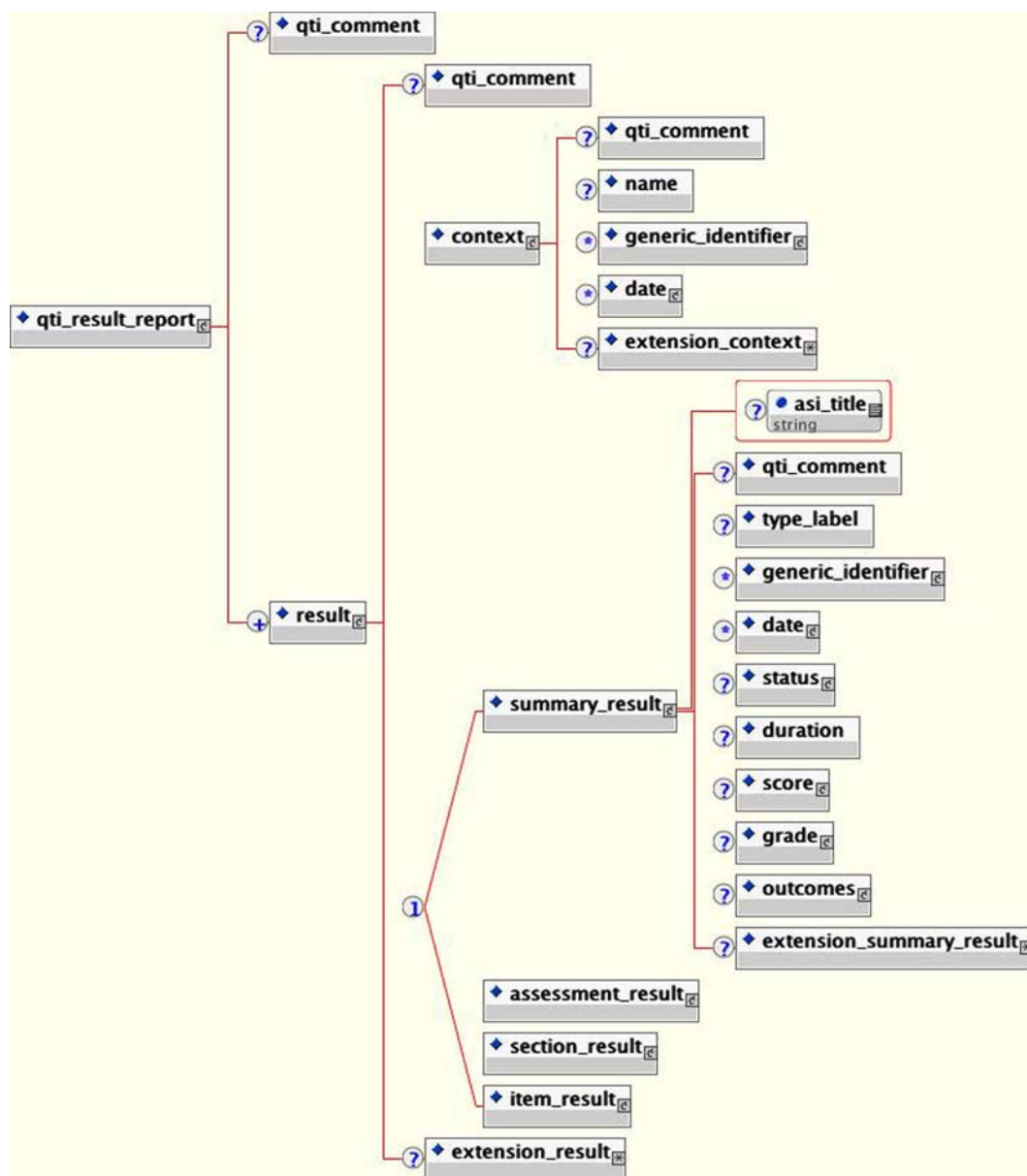
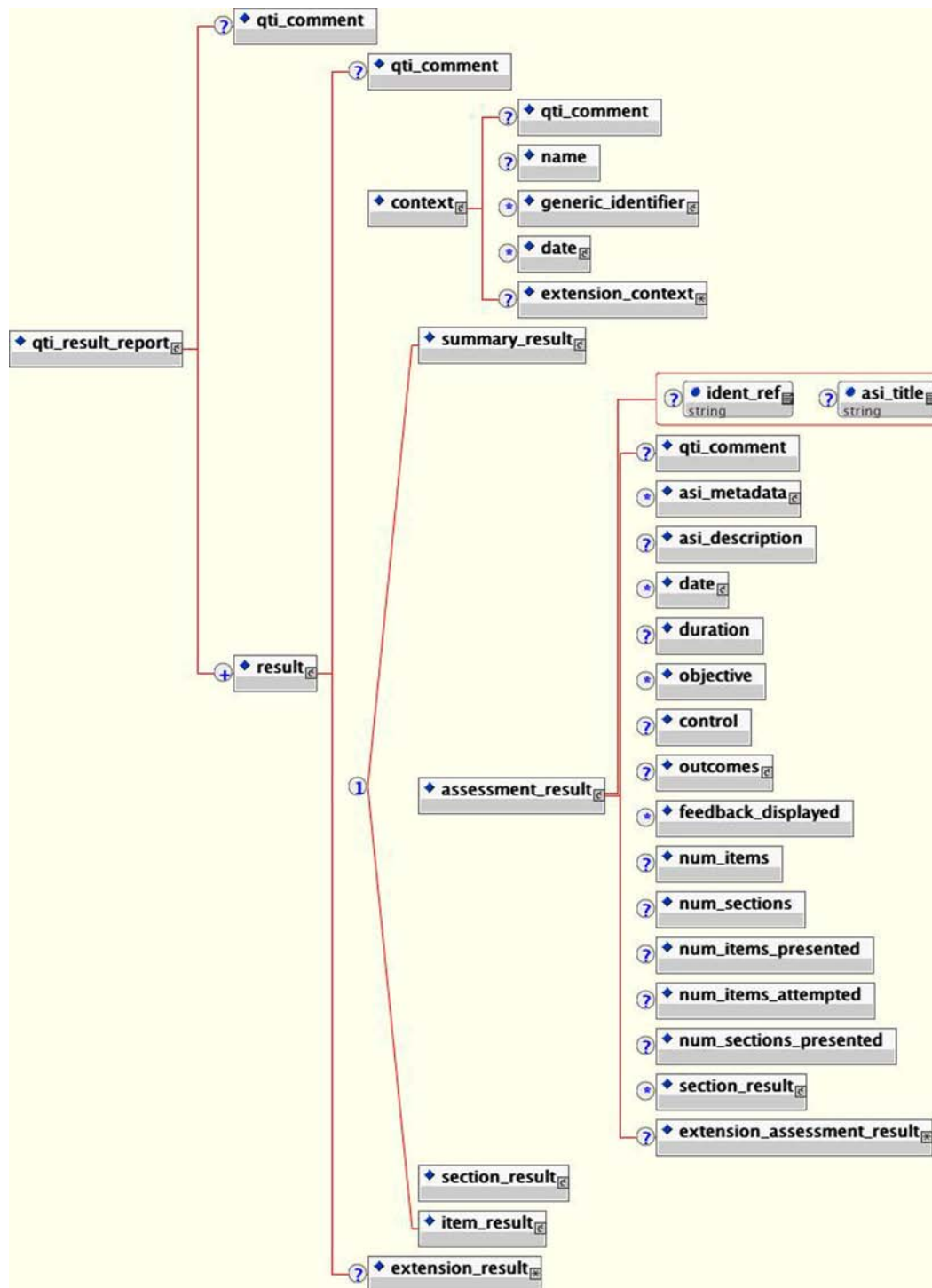


Figure 3.1 Summary reporting data structure.

### 3.2 Assessment Reporting



**Figure 3.2** Assessment reporting data structure.

### 3.3 Section Reporting

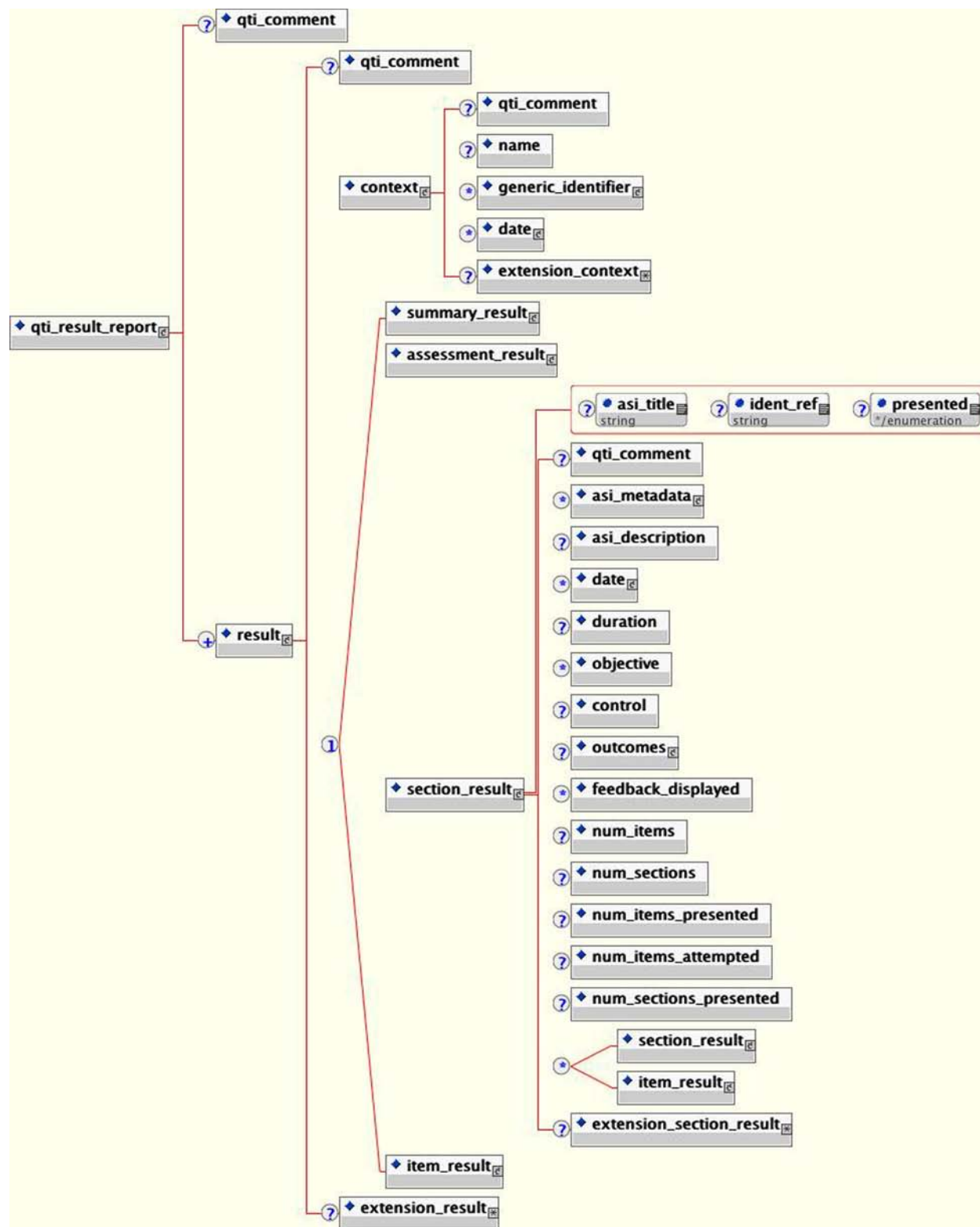


Figure 3.3 Section reporting data structure.



## 4. Basic XML Instance Examples

### 4.1 Reporting IMS QTI Items

#### 4.1.1 Reporting True/False IMS QTI Items

Below is an example of a True/false question as defined with QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

1	<questestinterop>
2	<item ident="IMS_V01_I_BasicExample001">
3	<presentation label="BasicExample001">
4	<flow>
5	<material>
6	<mattext>Paris is the Capital of France</mattext>
7	</material>
8	<response_lid ident="TF01" rcardinality="Single" rtiming="No">
9	<render_choice>
10	<flow_label>
11	<response_label ident="T">
12	<material><mattext>Agree</mattext></material>
13	</response_label>
14	<response_label ident="F">
15	<material><mattext>Disagree</mattext></material>
16	</response_label>
17	</flow_label>
18	</render_choice>
19	</response_lid>
20	</flow>
21	</presentation>
22	<resprocessing>
23	<outcomes>
24	<decvar minvalue="0" maxvalue="1" />
25	</outcomes>
26	<respcondition title="Correct">
27	<conditionvar>
28	<varequal respident="TF01">T</varequal>
29	</conditionvar>
30	<setvar action="Set">1</setvar>
31	<displayfeedback feedbacktype="Response" linkrefid="Correct" />
32	</respcondition>
33	</resprocessing>
34	<itemfeedback ident="Correct" view="Candidate">
35	<flow_mat>
36	<material><mattext>Yes, you are right.</mattext></material>
37	</flow_mat>
38	</itemfeedback>
39	</item>
40	</questestinterop>

The Result report of this Item assumes that the participant has entered the correct answer at the first attempt.

1	<qti_result_report>
2	<result>
3	<context/>
4	<item_result ident_ref = "IMS_V01_I_BasicExample001">
5	<asi_description uri = "original_ASI_XML_filename">
6	Paris is the Capital of France ? - True/False
7	</asi_description>
8	<response ident_ref = "TF01">
9	<response_form cardinality="single" render_type="choice" timing="No"
10	response_type = "lid">
11	<correct_response>T</correct_response>
12	</response_form>
13	<response_value>T</response_value>
14	</response>
15	<outcomes>
16	<score varname = "SCORE" vartype = "Integer">
17	<score_value>1</score_value>
18	<score_min>0</score_min>
19	<score_max>1</score_max>
20	<score_cut>1</score_cut>
21	</score>
22	</outcomes>
23	<feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
24	</item_result>
25	</result>
26	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_item\_tf01.xml'. The key points to note are:

- The initial Item identifier in the ASI-XML (line 2) is repeated in the Results Reporting structure (line 4);
- A description of the Item is contained in Results Reporting structure (lines 5-7);
- The response structure of the ASI-XML (line 8) is described in the Results Reporting structure (lines 9-10). The response identifier given in ASI-XML (line 8) is defined in the Results-XML (line 8);
- The actual score assigned to the participant, as a result of answering correctly, is stored in the Results-XML (lines 15-22).
- The feedback displayed to the participant, Results Reporting (line 23), is defined in the ASI-XML (lines 34-38).

#### 4.1.2 Multiple Choice IMS QTI Items

Below is an example of a Multiple-choice question as defined with QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

1	<questestinterop>
2	<item title="Standard Multiple Choice Item" ident="IMS_V01_I_BasicExample002b">
3	<presentation label="BasicExample002a">
4	<flow>
5	<material>
6	<mattext>
7	Which one of the listed standards committees is responsible
8	for developing the token ring specification ?
9	</mattext>
10	</material>
11	<response_lid ident="MCb_01" rcardinality="Single" rtiming="No">
12	<render_choice shuffle="Yes">

13	<response_label ident="A">
14	<flow_mat>
15	<material><mattext>IEEE 802.3</mattext></material>
16	</flow_mat>
17	</response_label>
18	<response_label ident="B">
19	<flow_mat>
20	<material><mattext>IEEE 802.5</mattext></material>
21	</flow_mat>
22	</response_label>
23	<response_label ident="C">
24	<flow_mat>
25	<material><mattext>IEEE 802.6</mattext></material>
26	</flow_mat>
27	</response_label>
28	<response_label ident="D">
29	<flow_mat>
30	<material><mattext>IEEE 802.11</mattext></material>
31	</flow_mat>
32	</response_label>
33	<response_label ident="E" rshuffle="No">
34	<flow_mat>
35	<material><mattext>None of the above.</mattext>
36	</material>
37	</flow_mat>
38	</response_label>
39	</render_choice>
40	</response_lid>
41	</flow>
42	</presentation>
43	<resprocessing>
44	<outcomes>
45	<decvar vartype="Integer" defaultval="0" minvalue="0" maxvalue="1"/>
46	</outcomes>
47	<respcondition title="Correct">
48	<conditionvar>
49	<varequal respident="MCb_01">A</varequal>
50	</conditionvar>
51	<setvar action="Set">1</setvar>
52	<displayfeedback feedbacktype="Response" linkrefid="Correct"/>
53	</respcondition>
54	</resprocessing>
55	<itemfeedback ident="Correct" view="Candidate">
56	<flow_mat>
57	<material><mattext>Yes, you are right.</mattext></material>
58	</flow_mat>
59	</itemfeedback>
60	</item>
61	</questestinterop>

The Result report of this Item assumes that the participant has entered the correct answer at the first attempt.

1	<qti_result_report>
2	<result>
3	<context/>
4	<item_result ident_ref= "IMS_V01_I_BasicExample002b">
5	<asi_description uri="origina_ASI_XML_filename">
6	IEEE Token Ring - Multiple-choice
7	</asi_description>
8	<response ident_ref = "MCb_01">
9	<response_form cardinality="single" render_type="choice"
10	timing="No" response_type="lid">
11	<correct_response>T</correct_response>
12	</response_form>
13	<num_attempts>1</num_attempts>
14	<response_value>B</response_value>
16	</response>
17	<outcomes>
18	<score varname = "SCORE" vartype = "Integer">
19	<score_value>1</score_value>
20	<score_min>0</score_min>
21	<score_max>1</score_max>
22	<score_cut>1</score_cut>
23	</score>
24	</outcomes>
25	<feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
26	</item_result>
27	</result>
28	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_item\_mc01.xml'. The key points to note are:

- The initial Item identifier in the ASI-XML (line 2) is repeated in the Results Reporting structure (line 4);
- A description of the Item is contained in Results Reporting structure (lines 5-7);
- The response structure of the ASI-XML (line 11) is described in the Results Reporting structure (lines 9-10). The response identifier given in ASI-XML (line 11) is defined in the Results-XML (line 8);
- The actual score assigned to the participant, as a result of answering correctly, is stored in the Results-XML (lines 17-24).
- The feedback displayed to the participant, Results Reporting (line 25), is defined in the ASI-XML (lines 55-59).

#### 4.1.3 Multiple Response IMS QTI Items

Below is an example of a Multiple-response question as defined with QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

1	<questestinterop>
2	<qticomment>
3	This is a multiple-response example.
4	The rendering is a standard check button style.
5	</qticomment>
6	<item title="Standard Multiple Response Item" ident="IMS_V01_I_BasicExample005">
7	<presentation label="RS05">
8	<flow>
9	<material>
10	<mattext>Which of the following elements are used to form water ?
11	</mattext>
12	</material>
13	<response_lid ident="MR01" rcardinality="Multiple" rtiming="No">
14	<render_choice shuffle="Yes" minnumber="1" maxnumber="4">



15	<response_label ident="A">
16	<flow_mat>
17	<material><mattext>Hydrogen</mattext></material>
18	</flow_mat>
19	</response_label>
20	<response_label ident="B">
21	<flow_mat>
22	<material><mattext>Helium</mattext></material>
23	</flow_mat>
24	</response_label>
25	<response_label ident="C">
26	<flow_mat>
27	<material><mattext>Carbon</mattext></material>
28	</flow_mat>
29	</response_label>
30	<response_label ident="D">
31	<flow_mat>
32	<material><mattext>Oxygen</mattext></material>
33	</flow_mat>
34	</response_label>
35	<response_label ident="E">
36	<flow_mat>
37	<material><mattext>Nitrogen</mattext></material>
38	</flow_mat>
39	</response_label>
40	<response_label ident="F">
41	<flow_mat>
42	<material><mattext>Chlorine</mattext></material>
43	</flow_mat>
44	</response_label>
45	</render_choice>
46	</response_lid>
47	</flow>
48	</presentation>
49	<resprocessing>
50	<outcomes>
51	<decvar varname="SCORE1" vartype="Integer" defaultval="1"/>
52	</outcomes>
53	<rescondition>
54	<qticomment>Scoring for the correct answer.</qticomment>
55	<conditionvar>
56	<varequal respident="MR01">A</varequal>
57	<varequal respident="MR01">D</varequal>
58	<not><varequal respident="MR01">B</varequal></not>
59	<not><varequal respident="MR01">C</varequal></not>
60	<not><varequal respident="MR01">E</varequal></not>
61	<not><varequal respident="MR01">F</varequal></not>
62	</conditionvar>
63	<setvar action="Add" varname="SCORE1">5</setvar>
54	<displayfeedback feedbacktype="Response" linkrefid="Correct"/>
55	</rescondition>
56	</resprocessing>
57	<itemfeedback ident="Correct" view="Candidate">
58	<material>
59	<mattext>Yes, Hydrogen and Oxygen.</mattext>
60	</material>
61	</itemfeedback>
62	</item>
63	</questestinterop>

The Result report of this Item assumes that the participant has entered the correct answer at the first attempt.

1	<qti_result_report>
2	<result>
3	<context/>
4	<item_result ident_ref = "IMS_V01_I_BasicExample005">
5	<asi_description uri = "original_ASI_XML_filename">Which of the following
6	elements are used to form water?
7	</asi_description>
8	<response ident_ref = "MR_01">
9	<response_form cardinality = "multiple" render_type = "choice" timing = "No"
10	response_type = "lid">
11	<correct_response>A</correct_response>
12	<correct_response>D</correct_response>
13	</response_form>
14	<num_attempts>1</num_attempts>
16	<response_value>A</response_value>
17	<response_value>D</response_value>
18	</response>
19	<outcomes>
20	<score varname = "SCORE1" vartype = "Integer">
21	<score_value>5</score_value>
22	<score_min>0</score_min>
23	<score_max>5</score_max>
24	<score_cut>5</score_cut>
25	</score>
26	</outcomes>
27	<feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
28	</item_result>
29	</result>
30	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_item\_mr01.xml'. The key points to note are:

- The initial Item identifier in the ASI-XML (line 2) is repeated in the Results Reporting structure (line 4);
- A description of the Item is contained in Results Reporting structure (lines 5-7);
- The response structure of the ASI-XML (line 13) is described in the Results Reporting structure (lines 9-10). The response identifier given in ASI-XML (line 13) is defined in the Results-XML (line 8);
- The actual score assigned to the participant, as a result of answering correctly, is stored in the Results-XML (lines 19-26).
- The feedback displayed to the participant, Results Reporting (line 27), is defined in the ASI-XML (lines 57-61).

#### 4.1.4 Fill-in-the-Blanks IMS QTI Items

Below is an example of a Fill-in-the-Blank question as defined with QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

```

1      <questestinterop>
2          <qticomment>
3              This is a standard multiple fill-in-blank (text) example.
4          </qticomment>
5          <item title="Standard FIB string Item" ident="IMS_V01_I_fibs_ir_002">
6              <presentation label="BasicExample013b">
7                  <flow>
8                      <material>
9                          <mattext>Fill-in-the blanks in this text from Richard III:
10                     </mattext>
11                 </material>
12                 <flow>
13                     <material>
14                         <mattext>Now is the </mattext>
15                     </material>
16                     <response_str ident="FIB01" rcardinality="Single" rtiming="No">
17                         <render_fib fibtype="String" prompt="Dashline" maxchars="6">
18                             <response_label ident="A"/>
19                         </render_fib>
20                     </response_str>
21                     <material>
22                         <mattext> of our discontent made glorious </mattext>
23                     </material>
24                     <response_str ident="FIB02" rcardinality="Single" rtiming="No">
25                         <render_fib fibtype="String" prompt="Dashline" maxchars="6">
26                             <response_label ident="A"/>
27                         </render_fib>
28                     </response_str>
29                     <material>
30                         <mattext> by these sons of </mattext>
31                     </material>
32                     <response_str ident="FIB03" rcardinality="Single" rtiming="No">
33                         <render_fib fibtype="String" prompt="Dashline" maxchars="4">
34                             <response_label ident="A"/>
35                         </render_fib>
36                     </response_str>
37                 </flow>
38             </flow>
39         </presentation>
40     </resprocessing>
41     <outcomes>
42         <decvar varname="FIBSCORE1" vartype="Integer" defaultval="0"/>
43     </outcomes>
44     <respcondition>
45         <qticomment>Scoring for the correct answer.</qticomment>
46         <conditionvar>
47             <varequal respident="FIB01" case="Yes">Winter</varequal>
48             <varequal respident="FIB02" case="Yes">Summer</varequal>
49             <varequal respident="FIB03" case="Yes">York</varequal>
50         </conditionvar>
51         <setvar action="Add" varname="FIBSCORE1">3</setvar>
52         <displayfeedback feedbacktype="Response" linkrefid="AllCorrect"/>
53     </respcondition>
54 </resprocessing>
55 <resprocessing>
56     <outcomes>
57         <decvar varname="DUMMY"/>
58     </outcomes>
59 </resprocessing>

```

60	<qticomment>Detecting incorrect asnwrs for feedback.</qticomment>
61	<conditionvar>
62	<not><varequal respident="FIB01" case="Yes">Winter</varequal></not>
63	</conditionvar>
64	<displayfeedback feedbacktype="Response" linkrefid="InCorrect1"/>
65	</respcondition>
66	</resprocessing>
67	<resprocessing>
68	<outcomes>
69	<decvar/>
70	</outcomes>
71	<respcondition>
72	<qticomment>Detecting incorrect asnwrs for feedback.</qticomment>
73	<conditionvar>
74	<not><varequal respident="FIB02" case="Yes">Summer</varequal></not>
75	</conditionvar>
76	<displayfeedback feedbacktype="Response" linkrefid="InCorrect2"/>
77	</respcondition>
78	</resprocessing>
79	<resprocessing>
80	<outcomes>
81	<decvar/>
82	</outcomes>
83	<respcondition>
84	<qticomment>Detecting incorrect asnwrs for feedback.</qticomment>
85	<conditionvar>
86	<not><varequal respident="FIB03" case="Yes">York</varequal></not>
87	</conditionvar>
88	<displayfeedback feedbacktype="Response" linkrefid="InCorrect3"/>
89	</respcondition>
90	</resprocessing>
91	<itemfeedback ident="AllCorrect" view="Candidate">
92	<flow_mat>
93	<material><mattext>All correct. Well done.</mattext></material>
94	</flow_mat>
95	</itemfeedback>
96	<itemfeedback ident="InCorrect1" view="Candidate">
97	<flow_mat>
98	<material>
99	<mattext>No. The correct first answer is "Winter".</mattext>
100	</material>
101	</flow_mat>
102	</itemfeedback>
103	<itemfeedback ident="InCorrect2" view="Candidate">
104	<flow_mat>
105	<material>
106	<mattext>No. The correct second answer is "Summer".</mattext>
107	</material>
108	</flow_mat>
109	</itemfeedback>
110	<itemfeedback ident="InCorrect3" view="Candidate">
111	<flow_mat>
112	<material>
113	<mattext>No. The correct third answer is "York".</mattext>
114	</material>
115	</flow_mat>
116	</itemfeedback>
117	</item>
118	</questestinterop>

The Result report of this Item assumes that the participant has entered the correct answer at the first attempt.

1	<qti_result_report>
2	<result>
3	<context/>
4	<item_result ident_ref = "IMS_V01_I_fibs_ir_002">
5	<asi_description uri="original_ASI_XML_filename">Richard III quotations.
6	</asi_description>
7	<response ident_ref = "FIB01">
8	<response_form cardinality = "single" render_type = "fib" timing = "No"
9	response_type = "str">
10	<correct_response>Winter</correct_response>
11	</response_form>
12	<num_attempts>1</num_attempts>
13	<response_value>Winter</response_value>
14	</response>
16	<response ident_ref = "FIB02">
17	<response_form cardinality = "single" render_type = "fib" timing = "No"
18	response_type = "str">
19	<correct_response>Summer</correct_response>
20	</response_form>
21	<num_attempts>1</num_attempts>
22	<response_value>Summer</response_value>
23	</response>
24	<response ident_ref = "FIB02">
25	<response_form cardinality = "single" render_type = "fib" timing = "No"
26	response_type = "str">
27	<correct_response>York</correct_response>
28	</response_form>
29	<num_attempts>1</num_attempts>
30	<response_value>York</response_value>
31	</response>
32	<outcomes>
33	<score varname = "FIBSCORE1" vartype = "Integer">
34	<score_value>3</score_value>
35	<score_min>0</score_min>
36	<score_max>3</score_max>
37	<score_cut>3</score_cut>
38	</score>
39	</outcomes>
40	<feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
41	</item_result>
42	</result>
43	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_item\_fb01.xml'. The key points to note are:

- The initial Item identifier in the ASI-XML (line 2) is repeated in the Results Reporting structure (line 4);
- A description of the Item is contained in Results Reporting structure (lines 5-6);
- The response structure of the ASI-XML (lines 16, 24 and 32) is described in the Results Reporting structure (lines 7-14, 15-23 and 24-31). The response identifier given in ASI-XML (line 16, 24 and 32) is defined in the Results-XML (lines 8, 17 and 25);
- The actual score assigned to the participant, as a result of answering correctly, is stored in the Results-XML (lines 32-39).
- The feedback displayed to the participant, Results Reporting (line 40), is defined in the ASI-XML (lines 91-95).

## 4.2 Reporting IMS QTI Sections

Below is an example of a Section with ten Items as defined using QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

1	<questestinterop>
2	<section ident = "IMS_QTIV1p2_S_ResReport_01">
3	<presentation_material>
4	<flow_mat>
5	<flow_mat>
6	<material>
7	<matimage uri="periodictable.jpg" x0="100" y0="100" height= "400"
8	width = "600"/>
9	</material>
10	</flow_mat>
11	<flow_mat>
12	<material>
13	<mattext>Answer the following questions on the Periodic Table
14	shown above.
15	</mattext>
16	</material>
17	</flow_mat>
18	</presentation_material>
19	<outcomes_processing scoremodel = "SumofScores">
20	<outcomes>
21	<decvar varname = "SCORE" vartype="Integer" minvalue= "0" maxvalue= "6"
22	cutvalue = "4"/>
23	</outcomes>
24	<outcomes_feedback_test>
25	<test_variable>
26	<variable_test testoperator = "GTE">4</variable_test>
27	</test_variable>
28	<displayfeedback linkrefid = "Section_Mastery"/>
29	</outcomes_feedback_test>
30	<outcomes_feedback_test>
31	<test_variable>
32	<variable_test testoperator = "LT">4</variable_test>
33	</test_variable>
34	<displayfeedback linkrefid = "">Section_Failed</displayfeedback>
35	</outcomes_feedback_test>
36	</outcomes_processing>
37	<sectionfeedback ident = "Section_Mastery">
38	<flow_mat>
39	<material>
40	<matemtext>You have passed this Section.</matemtext>
41	</material>
42	</flow_mat>
43	</sectionfeedback>
44	<sectionfeedback ident = "Section_Failed">
45	<flow_mat>
46	<material>
47	<mattext>You have failed this Section.</mattext>
48	</material>
49	</flow_mat>
50	</sectionfeedback>
51	<selection_ordering>
52	<selection>
53	<selection_number>6</selection_number>
54	

55	</selection>
56	<order order_type = "Random"/>
57	</selection_ordering>
58	<item ident = "IMS_QTIVlp2_I_SAO_01" maxattempts = "2">
59	<presentation>
60	<flow>
61	<material>
62	<mattext>Which one of following is an 'Inert' gas ?</mattext>
63	</material>
64	<response_lid ident = "LID01" rcardinality= "Single" rtiming = "No">
65	<render_choice shuffle = "Yes" minnumber = "1" maxnumber = "1">
66	<flow_label>
67	<response_label ident = "A">
68	<material>
69	<mattext>He</mattext>
70	</material>
71	</response_label>
72	</flow_label>
73	<flow_label>
74	<response_label ident = "B">
75	<material>
76	<mattext>C</mattext>
77	</material>
78	</response_label>
79	</flow_label>
80	<flow_label>
81	<response_label ident = "C">
82	<material>
83	<mattext>Zn</mattext>
84	</material>
85	</response_label>
86	</flow_label>
87	<flow_label>
88	<response_label ident = "D">
89	<material>
90	<mattext>Cl</mattext>
91	</material>
92	</response_label>
93	</flow_label>
94	<flow_label>
95	<response_label ident = "E">
96	<material>
97	<mattext>Li</mattext>
98	</material>
99	</response_label>
100	</flow_label>
101	</render_choice>
102	</response_lid>
103	</flow>
104	</presentation>
105	<resprocessing>
106	<qticomment/>
107	<outcomes>
108	<decvar defaultval = "0" minvalue = "0" maxvalue = "1"/>
109	</outcomes>
110	<respcondition continue = "Yes">
111	<qticomment>To detect if the correct answer has been supplied.
112	</qticomment>
113	<conditionvar>
114	<varequal respident = "LID01">A</varequal>

```

115         </conditionvar>
116         <setvar action = "Set" varname = "SCORE">1</setvar>
117         <displayfeedback feedbacktype = "Response" linkrefid = "Correct"/>
118     </respcondition>
119     <respcondition continue = "No">
120         <qticomment>To detect if the incorrect answer is supplied.
121     </qticomment>
122     <conditionvar>
123         <not>
124             <varequal respident = "LID01" case = "No">A</varequal>
125         </not>
126     </conditionvar>
127     <displayfeedback feedbacktype = "Response" linkrefid = "InCorrect"/>
128 </respcondition>
129 </resprocessing>
130 <itemfeedback ident = "Correct">
131     <material>
132         <mattext>Correct answer is A.</mattext>
133     </material>
134 </itemfeedback>
135 <itemfeedback ident = "Incorrect" view = "All">
136     <material>
137         <mattext xml:lang="en-US" xml:space="default" texttype=""
138             charset = "">Answers B, C, D and E are incorrect.
139         </mattext>
140     </material>
141 </itemfeedback>
142 </item>
143 <item ident = "IMS_QTIVlp2_I_SAO_02" maxattempts = "2">
144     <presentation>
145         <flow>
146             <material>
147                 <mattext>The symbol 'Cl' denotes which element ?</mattext>
148             </material>
149             <response_lid ident = "LID02" rcardinality= "Single" rtiming = "No">
150                 <render_choice shuffle = "Yes" minnumber = "1" maxnumber = "1">
151                     <flow_label>
152                         <response_label ident = "A">
153                             <material>
154                                 <mattext>Carbon</mattext>
155                             </material>
156                         </response_label>
157                     </flow_label>
158                     <flow_label>
159                         <response_label ident = "B">
160                             <material>
161                                 <mattext>Chlorine</mattext>
162                             </material>
163                         </response_label>
164                     </flow_label>
165                     <flow_label>
166                         <response_label ident = "C">
167                             <material>
168                                 <mattext>Calcium</mattext>
169                             </material>
170                         </response_label>
171                     </flow_label>
172                     <flow_label>
173                         <response_label ident = "D">
174                             <material>

```



175	<mattext>Caesium</mattext>
176	</material>
177	</response_label>
178	</flow_label>
179	</render_choice>
180	</response_lid>
181	</flow>
182	</presentation>
183	<resprocessing>
184	<outcomes>
185	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
186	maxvalue = "1" defaultval = "0"/>
187	</outcomes>
188	<respcondition continue = "Yes">
189	<qticomment>Correct response detection</qticomment>
190	<conditionvar>
191	<varequal respident = "LID02">B</varequal>
192	</conditionvar>
193	<setvar varname = "SCORE" action = "Set">1</setvar>
194	<displayfeedback linkrefid = "Correct" feedbacktype = "Response"/>
195	</respcondition>
196	<respcondition>
197	<conditionvar>
198	<not>
199	<varequal respident = "LID02">B</varequal>
200	</not>
201	</conditionvar>
202	<displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
203	</respcondition>
204	</resprocessing>
205	<itemfeedback ident = "Correct" view = "All">
206	<material>
207	<mattext>Correct.</mattext>
208	</material>
209	</itemfeedback>
210	<itemfeedback ident = "Incorrect" view = "All">
211	<material>
212	<mattext>No. The correct answer is Chlorine.</mattext>
213	</material>
214	</itemfeedback>
215	</item>
216	<item ident = "IMS_QTIV1p2_I_SAO_03" maxattempts = "2">
217	<presentation>
218	<flow>
219	<material>
220	<mattext>Which group of elements are the Halogens ?</mattext>
221	</material>
222	<response_lid ident = "TF01" rcardinality = "Single" rtiming = "No">
223	<render_choice shuffle = "Yes">
224	<flow_label>
225	<response_label ident = "A">
226	<material>
227	<mattext>H, Li, Na, K, Rb</mattext>
228	</material>
229	</response_label>
230	</flow_label>
231	<flow_label>
232	<response_label ident = "B">
233	<material>
234	<mattext>Be, Mg, Ca, Sr, Ba</mattext>

235	</material>
236	</response_label>
237	</flow_label>
238	<flow_label>
239	<response_label ident = "C">
240	<material>
241	<mattext>F, Cl, Br, I, At</mattext>
242	</material>
243	</response_label>
244	</flow_label>
245	<flow_label>
246	<response_label ident = "D">
247	<material>
248	<mattext>He, Ne, Ar, Kr, Xe</mattext>
249	</material>
250	</response_label>
251	</flow_label>
252	</render_choice>
253	</response_lid>
254	</flow>
255	</presentation>
256	<resprocessing>
257	<outcomes>
258	<decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
259	</outcomes>
260	<respcondition continue = "No">
261	<qticomment>Processing for the incorrect answer.</qticomment>
262	<conditionvar>
263	<not>
264	<varequal respident = "TF01">C</varequal>
265	</not>
266	</conditionvar>
267	<displayfeedback feedbacktype = "Response" linkrefid = "Incorrect"/>
268	</respcondition>
269	<respcondition continue = "No">
270	<qticomment>Processing for the correct answer.</qticomment>
271	<conditionvar>
272	<varequal respident = "TF01" case = "No">C</varequal>
273	</conditionvar>
274	<setvar action = "Set" varname = "SCORE">1</setvar>
275	<displayfeedback linkrefid = "Correct" feedbacktype = "Response"/>
276	</respcondition>
277	</resprocessing>
278	<itemfeedback ident = "Correct">
279	<material>
280	<mattext>Correct answer.</mattext>
281	</material>
282	</itemfeedback>
283	<itemfeedback ident = "Incorrect">
284	<material>
285	<mattext>Sorry, you are wrong. F, Cl, Br, I, At are the Halogens.
286	</mattext>
287	</material>
288	</itemfeedback>
289	</item>
290	<item ident = "IMS_QTIV1p2_I_SAO_04" maxattempts = "2">
291	<presentation>
292	<flow>
293	<material>
294	<mattext>What is the atomic number for Hydrogen ?</mattext>

```

295         </material>
296         <response_lid ident = "LID03" rcardinality= "Single" rtiming = "No">
297             <render_choice shuffle = "Yes">
298                 <flow_label>
299                     <response_label ident = "A">
300                         <material>
301                             <mattext>1</mattext>
302                         </material>
303                     </response_label>
304                 </flow_label>
305                 <flow_label>
306                     <response_label ident = "B">
307                         <material>
308                             <mattext>2</mattext>
309                         </material>
310                     </response_label>
311                 </flow_label>
312                 <flow_label>
313                     <response_label ident = "C">
314                         <material>
315                             <mattext>3</mattext>
316                         </material>
317                     </response_label>
318                 </flow_label>
319                 <flow_label>
320                     <response_label ident = "D">
321                         <material>
322                             <mattext>4</mattext>
323                         </material>
324                     </response_label>
325                 </flow_label>
326             </render_choice>
327         </response_lid>
328     </flow>
329 </presentation>
330 <resprocessing>
331     <outcomes>
332         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
333             maxvalue = "1" defaultval = "0"/>
334     </outcomes>
335     <respcondition continue = "No">
336         <qticomment>Correct response check</qticomment>
337         <conditionvar>
338             <varequal respident = "LID03" case = "No">A</varequal>
339         </conditionvar>
340         <setvar action = "Set" varname = "SCORE">1</setvar>
341         <displayfeedback linkrefid = "Correct" feedbacktype = "Response"/>
342     </respcondition>
343     <respcondition>
344         <conditionvar>
345             <not>
346                 <varequal respident = "LID03" case = "No">A</varequal>
347             </not>
348         </conditionvar>
349         <displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
350     </respcondition>
351 </resprocessing>
352 <itemfeedback ident = "Correct" view = "All">
353     <material>
354         <mattext>Correct.</mattext>

```

```

355         </material>
356     </itemfeedback>
357     <itemfeedback ident = "Incorrect" view = "All">
358         <material>
359             <mattext>No. The atomic weight of Hydrogen is '1'.</mattext>
360         </material>
361     </itemfeedback>
362 </item>
363 <item ident = "IMS_QTIV1p2_I_SAO_05" maxattempts = "2">
364     <presentation>
365         <flow>
366             <material>
367                 <mattext>What is the atomic symbol for the element Silver ?
368             </mattext>
369             </material>
370             <response_lid ident = "LID04" rcardinality= "Single" rtiming = "No">
371                 <render_choice shuffle = "No" minnumber = "1" maxnumber = "1">
372                     <flow_label>
373                         <response_label ident = "A">
374                             <material>
375                                 <mattext>Al</mattext>
376                             </material>
377                         </response_label>
378                     </flow_label>
379                     <flow_label>
380                         <response_label ident = "B">
381                             <material>
382                                 <mattext>Au</mattext>
383                             </material>
384                         </response_label>
385                     </flow_label>
386                     <flow_label>
387                         <response_label ident = "C">
388                             <material>
389                                 <mattext>Ar</mattext>
390                             </material>
391                         </response_label>
392                     </flow_label>
393                     <flow_label>
394                         <response_label ident = "D">
395                             <material>
396                                 <mattext>Ag</mattext>
397                             </material>
398                         </response_label>
399                     </flow_label>
400                 </render_choice>
401             </response_lid>
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407                 vartype = "Integer"/>
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409         <respcondition continue = "Yes">
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413             </conditionvar>
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415         <displayfeedback linkrefid = "Correct" feedbacktype = "Response"/>
416     </respcondition>
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418         <qtcomment>Incorrect response processing</qtcomment>
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420             <not>
421                 <varequal respident = "LID04">D</varequal>
422             </not>
423         </conditionvar>
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425     </respcondition>
426 </resprocessing>
427 <itemfeedback ident = "Correct" view = "All">
428     <material>
429         <mattext>Yes.</mattext>
430     </material>
431 </itemfeedback>
432 <itemfeedback ident = "Incorrect" view = "All">
433     <material>
434         <mattext>No. The atomic symbol for Silver is 'Ag'.</mattext>
435     </material>
436 </itemfeedback>
437 </item>
438 <item ident = "IMS_QTIV1p2_I_QTILiveTalkv1_06" maxattempts = "2">
439     <presentation>
440         <flow>
441             <material>
442                 <mattext>What is the atomic symbol for the common salt ?
443             </mattext>
444             </material>
445             <response_lid ident= "LID03" rcardinality= "Single" rtiming= "No">
446                 <render_choice shuffle = "Yes" minnumber = "1" maxnumber = "1">
447                     <flow_label>
448                         <response_label ident = "A">
449                             <material>
450                                 <mattext>CaCl</mattext>
451                             </material>
452                         </response_label>
453                     </flow_label>
454                     <flow_label>
455                         <response_label ident = "B">
456                             <material>
457                                 <mattext>NaCl</mattext>
458                             </material>
459                         </response_label>
460                     </flow_label>
461                     <flow_label>
462                         <response_label ident = "C">
463                             <material>
464                                 <mattext>CaBr</mattext>
465                             </material>
466                         </response_label>
467                     </flow_label>
468                     <flow_label>
469                         <response_label ident = "D">
470                             <material>
471                                 <mattext>NaBr</mattext>
472                             </material>
473                         </response_label>
474                     </flow_label>

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475         </render_choice>
476     </response_lid>
477 </flow>
478 </presentation>
479 <resprocessing>
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481         <decvar varname = "SCORE" vartype = "Integer" defaultval = "0"
482             minvalue = "0" maxvalue = "1"/>
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484     <respcondition>
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491     </respcondition>
492     <respcondition>
493         <qticomment>Incorrect answer response processing</qticomment>
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498         </conditionvar>
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501 </resprocessing>
502 <itemfeedback ident = "Correct" view = "All">
503     <material>
504         <mattext>Correct.</mattext>
505     </material>
506 </itemfeedback>
507 <itemfeedback ident = "Incorrect" view = "All">
508     <material>
509         <mattext>No. The atomic symbol for common salt is 'NaCl'.</mattext>
510     </material>
511 </itemfeedback>
512 </item>
513 <item ident = "IMS_QTIV1p2_I_SAO_07" maxattempts = "2">
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515         <flow>
516             <material>
517                 <mattext>'Fe' is the symbol for which element ?</mattext>
518             </material>
519             <response_lid ident= "LID03" rcardinality = "Single" rtiming = "No">
520                 <render_choice shuffle = "Yes" minnumber = "1" maxnumber = "1">
521                     <flow_label>
522                         <response_label ident = "A">
523                             <material>
524                                 <mattext>Gold</mattext>
525                             </material>
526                         </response_label>
527                     </flow_label>
528                     <flow_label>
529                         <response_label ident = "B">
530                             <material>
531                                 <mattext>Bronze</mattext>
532                             </material>
533                         </response_label>
534                     </flow_label>

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535	<flow_label>
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538	<mattext>Iron</mattext>
539	</material>
540	</response_label>
541	</flow_label>
542	<flow_label>
543	<response_label ident = "D">
544	<material>
545	<mattext>Mercury</mattext>
546	</material>
547	</response_label>
548	</flow_label>
549	</render_choice>
550	</response_lid>
551	</flow>
552	</presentation>
553	<resprocessing>
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556	<decvar varname = "SCORE" vartype = "Integer" defaultval = "0"
557	minvalue = "0" maxvalue = "1"/>
558	</outcomes>
559	<respcondition>
560	<qticomment>Correct answer response processing.</qticomment>
561	<conditionvar>
562	<varequal respident = "LID03">C</varequal>
563	</conditionvar>
564	<setvar varname = "SCORE" action = "Set">1</setvar>
565	<displayfeedback linkrefid = "Correct" feedbacktype = "Response"/>
566	</respcondition>
567	<respcondition>
568	<qticomment>Incorrect answer response processing.</qticomment>
569	<conditionvar>
570	<not>
571	<varequal respident = "LID03">C</varequal>
572	</not>
573	</conditionvar>
574	<displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
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576	</resprocessing>
577	<itemfeedback ident = "Correct" view = "All">
578	<material>
579	<mattext>Correct.</mattext>
580	</material>
581	</itemfeedback>
582	<itemfeedback ident = "Incorrect" view = "All">
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584	<mattext>No. 'Fe' is the atomic symbol for Iron.</mattext>
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592	<mattext>Galium Arsenide is known as a III-V compound ?</mattext>
593	</material>
594	<response_lid ident = "TF02" rcardinality = "Single" rtiming = "No">

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595         <render_choice shuffle = "Yes">
596             <flow_label>
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598                     <material>
599                         <mattext>True</mattext>
600                     </material>
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602             </flow_label>
603             <flow_label>
604                 <response_label ident = "F">
605                     <material>
606                         <mattext>False</mattext>
607                     </material>
608                 </response_label>
609             </flow_label>
610         </render_choice>
611     </response_lid>
612 </flow>
613 </presentation>
614 <resprocessing>
615     <qticomment>Processing for the correct answer.</qticomment>
616     <outcomes>
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618     </outcomes>
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626     <respcondition continue = "No">
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629         </conditionvar>
630         <displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
631     </respcondition>
632 </resprocessing>
633 <itemfeedback ident = "Correct">
634     <material>
635         <mattext>Correct answer.</mattext>
636     </material>
637 </itemfeedback>
638 <itemfeedback ident = "Incorrect">
639     <material>
640         <mattext>Incorrect. Galium Arsendie is a III-V compound.</mattext>
641     </material>
642 </itemfeedback>
643 </item>
644 <item ident = "IMS_QTIV1p2_I_SAO_09" maxattempts = "2">
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647             <material>
648                 <mattext>Six is the atomic weight of the element most significant
649                     for the creation of on Earth ?
650                 </mattext>
651             </material>
652             <response_lid ident = "TF03" rcardinality = "Single" rtiming = "No">
653                 <render_choice shuffle = "Yes">
654                     <flow_label>

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655	<response_label id = "T">
656	<material>
657	<mattext>True</mattext>
658	</material>
659	</response_label>
660	</flow_label>
661	<flow_label>
662	<response_label id = "F">
663	<material>
664	<mattext>False</mattext>
665	</material>
667	</response_label>
668	</flow_label>
669	</render_choice>
670	</response_lid>
671	</flow>
672	</presentation>
673	<resprocessing>
674	<qticomment>Processing for the correct answer.</qticomment>
675	<outcomes>
676	<decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
677	</outcomes>
678	<respcondition>
679	<conditionvar>
680	<varequal respident = "TF03">T</varequal>
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682	<setvar action = "Set" varname = "SCORE">1</setvar>
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685	<respcondition continue = "No">
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687	<varequal respident = "TF03" case = "No">F</varequal>
688	</conditionvar>
689	<displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
690	</respcondition>
691	</resprocessing>
692	<itemfeedback id = "Correct">
693	<material>
694	<mattext>Correct i.e. the element Carbon.</mattext>
695	</material>
696	</itemfeedback>
697	<itemfeedback id = "Incorrect">
698	<material>
699	<mattext>Sorry, you are wrong. Carbon has an atomic weight of six.
700	</mattext>
701	</material>
702	</itemfeedback>
703	</item>
704	<item id = "IMS_QTIV1p2_I_SAO_10" maxattempts = "2">
705	<presentation>
706	<flow>
707	<material>
708	<mattext>Is Lutetium the last element in the Lanthanide Series ?
709	</mattext>
710	</material>
711	<response_lid id = "TF04" rcardinality = "Single" rtiming = "No">
712	<render_choice shuffle = "Yes">
713	<flow_label>
714	<response_label id = "T">

715	<material>
716	<mattext>True</mattext>
717	</material>
718	</response_label>
719	</flow_label>
720	<flow_label>
721	<response_label ident = "F">
723	<material>
724	<mattext>False</mattext>
725	</material>
726	</response_label>
727	</flow_label>
728	</render_choice>
729	</response_lid>
730	</flow>
731	</presentation>
732	<resprocessing>
733	<qticomment>Processing for the correct answer.</qticomment>
734	<outcomes>
735	<decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
736	</outcomes>
737	<respcondition>
738	<conditionvar>
739	<varequal respident = "TF04">T</varequal>
740	</conditionvar>
741	<setvar action = "Set" varname = "SCORE">1</setvar>
742	<displayfeedback feedbacktype = "Response" linkrefid = "Correct"/>
743	</respcondition>
744	<respcondition continue = "No">
745	<conditionvar>
746	<varequal respident = "TF04" case = "No">F</varequal>
747	</conditionvar>
748	<displayfeedback linkrefid = "Incorrect" feedbacktype = "Response"/>
749	</respcondition>
750	</resprocessing>
751	<itemfeedback ident = "Correct">
752	<material>
753	<mattext>Correct answer.</mattext>
754	</material>
755	</itemfeedback>
756	<itemfeedback ident = "Incorrect">
757	<material>
758	<mattext>Sorry, you are wrong. Lutetium is the last element in the
759	Lathanide Series.
760	</mattext>
761	</material>
762	</itemfeedback>
763	</item>
764	</section>
765	</questestinterop>

The Result report of this Section assumes that the participant has entered the answer at the first attempt for all six of the presented Items. Five of the Items have been answered correctly.

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1      <qti_result_report>
2          <result>
3              <context>
4                  <name>Bruce Wayne</name>
5                  <generic_identifier>
6                      <type_label>Student Number</type_label>
7                      <identifier_string>TestCo:156805D</identifier_string>
8                  </generic_identifier>
9                  <date>
10                     <type_label>Exam</type_label>
11                     <datetime>2001-08-07T14:00:00</datetime>
12                 </date>
13             </context>
14             <section_result asi_title = "Example Section Title"
15                 ident_ref = "IMS_QTIV1p2_S_ResReport_01">
16                 <date>
17                     <type_label>Section Creation Time</type_label>
18                     <datetime>2001-08-07T13:40:00</datetime>
19                 </date>
20                 <control hint_switch = "No" solution_switch = "No" feedback_switch = "Yes"/>
21                 <outcomes>
22                     <score varname = "SCORE" vartype = "Integer">
23                         <score_value>5</score_value>
24                         <score_min>0</score_min>
25                         <score_max>6</score_max>
26                         <score_cut>4</score_cut>
27                     </score>
28                 </outcomes>
29                 <feedback_displayed ident_ref = "Section_Passed">Response</feedback_displayed>
30                 <num_items>10</num_items>
31                 <num_items_presented>6</num_items_presented>
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44                         </response_form>
45                         <num_attempts>1</num_attempts>
46                         <response_value>A</response_value>
47                     </response>
48                     <outcomes>
49                         <score varname = "SCORE" vartype = "Integer">
50                             <score_value>1</score_value>
51                             <score_min>0</score_min>
52                             <score_max>1</score_max>
53                         </score>
54                     </outcomes>
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56                 </item_result>
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58                     <date>
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68             <num_attempts>1</num_attempts>
69             <response_value>B</response_value>
70         </response>
71         <outcomes>
72             <score varname = "SCORE" vartype = "Integer">
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74                 <score_min>0</score_min>
75                 <score_max>1</score_max>
76             </score>
77         </outcomes>
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91         </response>
92     </item_result>
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101                 response_type = "lid">
102                 <correct_response>A</correct_response>
103             </response_form>
104             <num_attempts>1</num_attempts>
105             <response_value response_status = "Valid">D</response_value>
106         </response>
107         <outcomes>
108             <score varname = "SCORE" vartype = "Integer" status = "Valid">
109                 <score_value>0</score_value>
110                 <score_min>0</score_min>
111                 <score_max>1</score_max>
112             </score>
113         </outcomes>
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116     <item_result ident_ref = "IMS_QTIV1p2_I_SAO_05" presented = "Yes">
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127             <num_attempts>1</num_attempts>
128             <response_value response_status = "Valid">D</response_value>
129         </response>
130         <outcomes>
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132                 <score_value>1</score_value>
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136         </outcomes>
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147                 response_type = "lid">
148                 <correct_response>B</correct_response>
149             </response_form>
150         </response>
151     </item_result>
152     <item_result ident_ref = "IMS_QTIV1p2_I_SAO_07" presented = "Yes">
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160                 response_type = "lid">
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162             </response_form>
163             <num_attempts>1</num_attempts>
164             <response_value response_status = "Valid">C</response_value>
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166         <outcomes>
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169                 <score_min>0</score_min>
170                 <score_max>1</score_max>
171             </score>
172         </outcomes>
173         <feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
174     </item_result>
175     <item_result ident_ref = "IMS_QTIV1p2_I_SAO_08" presented = "No">
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181	<response ident_ref = "TF02">
182	<response_form cardinality= "single" render_type= "choice" timing= "No"
183	response_type = "lid">
184	<correct_response>T</correct_response>
185	</response_form>
186	</response>
187	</item_result>
188	<item_result ident_ref = "IMS_QTIV1p2_I_SAO_09" presented = "Yes">
189	<date>
190	<type_label>Item Creation Time</type_label>
191	<datetime>2001-08-07T13:44:00</datetime>
192	</date>
193	<duration>P0Y0M0DT0H2M</duration>
194	<response ident_ref = "TF03">
195	<response_form cardinality= "single" render_type= "choice" timing= "No"
196	response_type = "lid">
197	<correct_response>T</correct_response>
198	</response_form>
199	<num_attempts>1</num_attempts>
200	<response_value response_status = "Valid">T</response_value>
201	</response>
202	<outcomes>
203	<score varname = "SCORE" vartype = "Integer" status = "Valid">
204	<score_value>1</score_value>
205	<score_min>0</score_min>
206	<score_max>1</score_max>
207	</score>
208	</outcomes>
209	<feedback_displayed ident_ref = "Correct">Response</feedback_displayed>
210	</item_result>
211	<item_result ident_ref = "IMS_QTIV1p2_I_SAO_10" presented = "No">
212	<date>
213	<type_label>Item Creation Time</type_label>
214	<datetime>2001-08-07T13:43:00</datetime>
215	</date>
216	<duration>P0Y0M0DT0H2M</duration>
217	<response ident_ref = "TF04">
218	<response_form cardinality= "single" render_type= "choice" timing= "No"
219	response_type = "lid">
220	<correct_response>T</correct_response>
221	</response_form>
222	</response>
223	</item_result>
224	</section_result>
225	</result>
226	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_sc\_section02.xml'. The key points to note are:

- There is an Item result report for ALL of the Items. Items that were not presented are denoted using the attribute value *presented='No'* on the *item\_result* element;
- The Section and Item summaries given in the section\_result element shown that the Section contains 10 Items of which 6 were presented and attempted, from the 1 presented Section (lines 30-33);
- The correct response has been returned for all of the Items. The manner in which this is derived from the original ASI structure is outside the scope of this specification.

## 4.3 Reporting IMS QTI Assessments

Below is an example of an Assessment with ten Items as defined using QTI-XML and the associated Results Reporting structure required to report on an instance of that Item being answered and reported.

1	<questestinterop>
2	<assessment ident = "IMS_QTIV1p2_A_ResReport_02">
3	<outcomes_processing scoremodel = "SumofScores">
4	<outcomes>
5	<decvar varname= "SCORE" vartype= "Integer" minvalue= "0" maxvalue= "6"
6	cutvalue = "4"/>
7	</outcomes>
8	<outcomes_feedback_test>
9	<test_variable>
10	<variable_test testoperator = "GTE">4</variable_test>
11	</test_variable>
12	<displayfeedback linkrefid = "Test_Passed"/>
13	</outcomes_feedback_test>
14	<outcomes_feedback_test>
15	<test_variable>
16	<variable_test testoperator = "LT">4</variable_test>
17	</test_variable>
18	<displayfeedback linkrefid = "">Test_Failed</displayfeedback>
19	</outcomes_feedback_test>
20	</outcomes_processing>
21	<assessfeedback ident = "Test_Passed">
22	<flow_mat>
23	<material>
24	<mattext>Well done. You have passed this test.</mattext>
25	</material>
26	</flow_mat>
27	</assessfeedback>
28	<assessfeedback ident = "Test_Failed">
29	<flow_mat>
30	<material>
31	<mattext>Sorry. You have failed this test.</mattext>
32	</material>
33	</flow_mat>
34	</assessfeedback>
35	<section ident = "IMS_QTIV1p2_S_ResReport_01">
36	<presentation_material>
37	<flow_mat>
38	<flow_mat>
39	<material>
40	<matimage uri = "periodictable.jpg" x0 = "100" y0 = "100"
41	height = "400" width = "600"/>
42	</material>
43	</flow_mat>
44	<flow_mat>
45	<material>
46	<mattext>Answer the following questions on the Periodic Table
47	shown above.
48	</mattext>
49	</material>
50	</flow_mat>
51	</flow_mat>
52	</presentation_material>
53	<outcomes_processing scoremodel = "SumofScores">
54	<outcomes>

55	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
56	maxvalue = "6" cutvalue = "4"/>
57	</outcomes>
58	<outcomes_feedback_test>
59	<test_variable>
60	<variable_test testoperator = "GTE">4</variable_test>
61	</test_variable>
62	<displayfeedback linkrefid = "Section_Mastery"/>
63	</outcomes_feedback_test>
64	<outcomes_feedback_test>
65	<test_variable>
66	<variable_test testoperator = "LT">4</variable_test>
67	</test_variable>
68	<displayfeedback linkrefid = "">Section_Failed</displayfeedback>
69	</outcomes_feedback_test>
70	</outcomes_processing>
71	<sectionfeedback ident = "Section_Mastery">
72	<flow_mat>
73	<material>
74	<matemtext>You have passed this Section.</matemtext>
75	</material>
76	</flow_mat>
77	</sectionfeedback>
78	<sectionfeedback ident = "Section_Failed">
79	<flow_mat>
80	<material>
81	<mattext>You have failed this Section.</mattext>
82	</material>
83	</flow_mat>
84	</sectionfeedback>
85	<selection_ordering>
86	<selection>
87	<selection_number>6</selection_number>
88	</selection>
89	<order order_type = "Random"/>
90	</selection_ordering>
91	<item ident = "IMS_QTIVlp2_I_SAO_01" maxattempts = "2">
92	<presentation>
93	<flow>
94	<material>
95	<mattext>Which one of following is an 'Inert' gas ?</mattext>
96	</material>
97	<response_lid ident= "LID01" rcardinality="Single" rtiming= "No">
98	<render_choice shuffle= "Yes" minnumber= "1" maxnumber= "1">
99	<flow_label>
100	<response_label ident = "A">
101	<material>
102	<mattext>He</mattext>
103	</material>
104	</response_label>
105	</flow_label>
106	<flow_label>
107	<response_label ident = "B">
108	<material>
109	<mattext>C</mattext>
110	</material>
111	</response_label>
112	</flow_label>
113	<flow_label>
114	<response_label ident = "C">



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115         <material>
116             <mattext>Zn</mattext>
117         </material>
118     </response_label>
119 </flow_label>
120 <flow_label>
121     <response_label ident = "D">
122         <material>
123             <mattext>Cl</mattext>
124         </material>
125     </response_label>
126 </flow_label>
127 <flow_label>
128     <response_label ident = "E">
129         <material>
130             <mattext>Li</mattext>
131         </material>
132     </response_label>
133 </flow_label>
134 </render_choice>
135 </response_lid>
136 </flow>
137 </presentation>
138 <resprocessing>
139     <qticomment/>
140     <outcomes>
141         <decvar defaultval = "0" minvalue = "0" maxvalue = "1"/>
142     </outcomes>
143     <respcondition continue = "Yes">
144         <qticomment>To detect if the correct answer has been supplied.
145         </qticomment>
146         <conditionvar>
147             <varequal respident = "LID01">A</varequal>
148         </conditionvar>
149         <setvar action = "Set" varname = "SCORE">1</setvar>
150         <displayfeedback feedbacktype= "Response" linkrefid = "Correct"/>
151     </respcondition>
152     <respcondition continue = "No">
153         <qticomment>To detect if the incorrect answer is supplied.
154         </qticomment>
155         <conditionvar>
156             <not>
157                 <varequal respident = "LID01" case = "No">A</varequal>
158             </not>
159         </conditionvar>
160         <displayfeedback feedbacktype="Response" linkrefid="InCorrect"/>
161     </respcondition>
162 </resprocessing>
163 <itemfeedback ident = "Correct">
164     <material>
165         <mattext>Correct answer is A.</mattext>
166     </material>
167 </itemfeedback>
168 <itemfeedback ident = "Incorrect" view = "All">
169     <material>
170         <mattext xml:lang = "en-US" xml:space = "default" texttype = ""
171             charset = "">Answers B, C, D and E are incorrect.</mattext>
172     </material>
173 </itemfeedback>
174 </item>

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175         <item ident = "IMS_QTIVlp2_I_SAO_02" maxattempts = "2">
176             <presentation>
177                 <flow>
178                     <material>
179                         <mattext>The symbol 'Cl' denotes which element ?</mattext>
180                     </material>
181                     <response_lid ident="LID02" rcardinality = "Single" rtiming= "No">
182                         <render_choice shuffle= "Yes" minnumber= "1" maxnumber= "1">
183                             <flow_label>
184                                 <response_label ident = "A">
185                                     <material>
186                                         <mattext>Carbon</mattext>
187                                     </material>
188                                 </response_label>
189                             </flow_label>
190                             <flow_label>
191                                 <response_label ident = "B">
192                                     <material>
193                                         <mattext>Chlorine</mattext>
194                                     </material>
195                                 </response_label>
196                             </flow_label>
197                             <flow_label>
198                                 <response_label ident = "C">
199                                     <material>
200                                         <mattext>Calcium</mattext>
201                                     </material>
202                                 </response_label>
203                             </flow_label>
204                             <flow_label>
205                                 <response_label ident = "D">
206                                     <material>
207                                         <mattext>Caesium</mattext>
208                                     </material>
209                                 </response_label>
210                             </flow_label>
211                         </render_choice>
212                     </response_lid>
213                 </flow>
214             </presentation>
215             <resprocessing>
216                 <outcomes>
217                     <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
218                         maxvalue = "1" defaultval = "0"/>
219                 </outcomes>
220                 <respcondition continue = "Yes">
221                     <qticomment>Correct response detection</qticomment>
222                     <conditionvar>
223                         <varequal respident = "LID02">B</varequal>
224                     </conditionvar>
225                     <setvar varname = "SCORE" action = "Set">1</setvar>
226                     <displayfeedback linkrefid= "Correct" feedbacktype = "Response"/>
227                 </respcondition>
228                 <respcondition>
229                     <conditionvar>
230                         <not>
231                             <varequal respident = "LID02">B</varequal>
232                         </not>
233                     </conditionvar>
234                     <displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/>

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235         </responcondition>
236     </resprocessing>
237     <itemfeedback ident = "Correct" view = "All">
238         <material>
239             <mattext>Correct.</mattext>
240         </material>
241     </itemfeedback>
242     <itemfeedback ident = "Incorrect" view = "All">
243         <material>
244             <mattext>No. The correct answer is Chlorine.</mattext>
245         </material>
246     </itemfeedback>
247 </item>
248 <item ident = "IMS_QTIV1p2_I_SAO_03" maxattempts = "2">
249     <presentation>
250         <flow>
251             <material>
252                 <mattext>Which group of elements are the Halogens ?</mattext>
253             </material>
254             <response_lid ident= "TF01" rcardinality= "Single" rtiming= "No">
255                 <render_choice shuffle = "Yes">
256                     <flow_label>
257                         <response_label ident = "A">
258                             <material>
259                                 <mattext>H, Li, Na, K, Rb</mattext>
260                             </material>
261                         </response_label>
262                     </flow_label>
263                     <flow_label>
264                         <response_label ident = "B">
265                             <material>
266                                 <mattext>Be, Mg, Ca, Sr, Ba</mattext>
267                             </material>
268                         </response_label>
269                     </flow_label>
270                     <flow_label>
271                         <response_label ident = "C">
272                             <material>
273                                 <mattext>F, Cl, Br, I, At</mattext>
274                             </material>
275                         </response_label>
276                     </flow_label>
277                     <flow_label>
278                         <response_label ident = "D">
279                             <material>
280                                 <mattext>He, Ne, Ar, Kr, Xe</mattext>
281                             </material>
282                         </response_label>
283                     </flow_label>
284                 </render_choice>
285             </response_lid>
286         </flow>
287     </presentation>
288 </resprocessing>
289     <outcomes>
290         <decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
291     </outcomes>
292     <responcondition continue = "No">
293         <qticomment>Processing for the incorrect answer.</qticomment>
294     <conditionvar>

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295	<not>
296	<varequal respident = "TF01">C</varequal>
297	</not>
298	</conditionvar>
299	<displayfeedback feedbacktype="Response" linkrefid= "Incorrect"/>
300	</respcondition>
301	<respcondition continue = "No">
302	<qticomment>Processing for the correct answer.</qticomment>
303	<conditionvar>
304	<varequal respident = "TF01" case = "No">C</varequal>
305	</conditionvar>
306	<setvar action = "Set" varname = "SCORE">1</setvar>
307	<displayfeedback linkrefid ="Correct" feedbacktype = "Response"/>
308	</respcondition>
309	</resprocessing>
310	<itemfeedback ident = "Correct">
311	<material>
312	<mattext>Correct answer.</mattext>
313	</material>
314	</itemfeedback>
315	<itemfeedback ident = "Incorrect">
316	<material>
317	<mattext>Sorry, you are wrong. F, Cl, Br, I, At are the
318	Halogens.
319	</mattext>
320	</material>
321	</itemfeedback>
322	</item>
323	<item ident = "IMS_QTIVlp2_I_SAO_04" maxattempts = "2">
324	<presentation>
325	<flow>
326	<material>
327	<mattext>What is the atomic number for Hydrogen ?</mattext>
328	</material>
329	<response_lid ident="LID03" rcardinality="Single" rtiming= "No">
330	<render_choice shuffle = "Yes">
331	<flow_label>
332	<response_label ident = "A">
333	<material>
334	<mattext>1</mattext>
335	</material>
336	</response_label>
337	</flow_label>
338	<flow_label>
339	<response_label ident = "B">
340	<material>
341	<mattext>2</mattext>
342	</material>
343	</response_label>
344	</flow_label>
345	<flow_label>
346	<response_label ident = "C">
347	<material>
348	<mattext>3</mattext>
349	</material>
350	</response_label>
351	</flow_label>
352	<flow_label>
353	<response_label ident = "D">
354	<material>

355	<code>&lt;mattext&gt;4&lt;/mattext&gt;</code>
356	<code>&lt;/material&gt;</code>
357	<code>&lt;/response_label&gt;</code>
358	<code>&lt;/flow_label&gt;</code>
359	<code>&lt;/render_choice&gt;</code>
360	<code>&lt;/response_lid&gt;</code>
361	<code>&lt;/flow&gt;</code>
362	<code>&lt;/presentation&gt;</code>
363	<code>&lt;resprocessing&gt;</code>
364	<code>&lt;outcomes&gt;</code>
365	<code>&lt;decvar varname = "SCORE" vartype = "Integer" minvalue = "0"</code>
366	<code>maxvalue = "1" defaultval = "0"/&gt;</code>
367	<code>&lt;/outcomes&gt;</code>
368	<code>&lt;respcondition continue = "No"&gt;</code>
369	<code>&lt;qticomment&gt;Correct response check&lt;/qticomment&gt;</code>
370	<code>&lt;conditionvar&gt;</code>
371	<code>&lt;varequal respident = "LID03" case = "No"&gt;A&lt;/varequal&gt;</code>
372	<code>&lt;/conditionvar&gt;</code>
373	<code>&lt;setvar action = "Set" varname = "SCORE"&gt;1&lt;/setvar&gt;</code>
374	<code>&lt;displayfeedback linkrefid = "Correct" feedbacktype= "Response"/&gt;</code>
375	<code>&lt;/respcondition&gt;</code>
376	<code>&lt;respcondition&gt;</code>
377	<code>&lt;conditionvar&gt;</code>
378	<code>&lt;not&gt;</code>
379	<code>&lt;varequal respident = "LID03" case = "No"&gt;A&lt;/varequal&gt;</code>
380	<code>&lt;/not&gt;</code>
381	<code>&lt;/conditionvar&gt;</code>
382	<code>&lt;displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/&gt;</code>
383	<code>&lt;/respcondition&gt;</code>
384	<code>&lt;/resprocessing&gt;</code>
385	<code>&lt;itemfeedback ident = "Correct" view = "All"&gt;</code>
386	<code>&lt;material&gt;</code>
387	<code>&lt;mattext&gt;Correct.&lt;/mattext&gt;</code>
388	<code>&lt;/material&gt;</code>
389	<code>&lt;/itemfeedback&gt;</code>
390	<code>&lt;itemfeedback ident = "Incorrect" view = "All"&gt;</code>
391	<code>&lt;material&gt;</code>
392	<code>&lt;mattext&gt;No. The atomic weight of Hydrogen is '1'.&lt;/mattext&gt;</code>
393	<code>&lt;/material&gt;</code>
394	<code>&lt;/itemfeedback&gt;</code>
395	<code>&lt;/item&gt;</code>
396	<code>&lt;item ident = "IMS_QTIVlp2_I_SAO_05" maxattempts = "2"&gt;</code>
397	<code>&lt;presentation&gt;</code>
398	<code>&lt;flow&gt;</code>
399	<code>&lt;material&gt;</code>
400	<code>&lt;mattext&gt;What is the atomic symbol for the element Silver ?</code>
401	<code>&lt;/mattext&gt;</code>
402	<code>&lt;/material&gt;</code>
403	<code>&lt;response_lid ident="LID04" rcardinality="Single" rtiming = "No"&gt;</code>
404	<code>&lt;render_choice shuffle= "No" minnumber= "1" maxnumber= "1"&gt;</code>
405	<code>&lt;flow_label&gt;</code>
406	<code>&lt;response_label ident = "A"&gt;</code>
407	<code>&lt;material&gt;</code>
408	<code>&lt;mattext&gt;Al&lt;/mattext&gt;</code>
409	<code>&lt;/material&gt;</code>
410	<code>&lt;/response_label&gt;</code>
411	<code>&lt;/flow_label&gt;</code>
412	<code>&lt;flow_label&gt;</code>
413	<code>&lt;response_label ident = "B"&gt;</code>
414	<code>&lt;material&gt;</code>

415	<code>&lt;mattext&gt;Au&lt;/mattext&gt;</code>
416	<code>&lt;/material&gt;</code>
417	<code>&lt;/response_label&gt;</code>
418	<code>&lt;/flow_label&gt;</code>
419	<code>&lt;flow_label&gt;</code>
420	<code>&lt;response_label ident = "C"&gt;</code>
421	<code>&lt;material&gt;</code>
422	<code>&lt;mattext&gt;Ar&lt;/mattext&gt;</code>
423	<code>&lt;/material&gt;</code>
424	<code>&lt;/response_label&gt;</code>
425	<code>&lt;/flow_label&gt;</code>
426	<code>&lt;flow_label&gt;</code>
427	<code>&lt;response_label ident = "D"&gt;</code>
428	<code>&lt;material&gt;</code>
429	<code>&lt;mattext&gt;Ag&lt;/mattext&gt;</code>
430	<code>&lt;/material&gt;</code>
431	<code>&lt;/response_label&gt;</code>
432	<code>&lt;/flow_label&gt;</code>
433	<code>&lt;/render_choice&gt;</code>
434	<code>&lt;/response_lid&gt;</code>
435	<code>&lt;/flow&gt;</code>
436	<code>&lt;/presentation&gt;</code>
437	<code>&lt;resprocessing&gt;</code>
438	<code>&lt;outcomes&gt;</code>
439	<code>&lt;decvar varname = "SCORE" defaultval = "0" minvalue = "0"</code>
440	<code>maxvalue = "1" vartype = "Integer"/&gt;</code>
441	<code>&lt;/outcomes&gt;</code>
442	<code>&lt;respcondition continue = "Yes"&gt;</code>
443	<code>&lt;qticomment&gt;Correct response processing&lt;/qticomment&gt;</code>
444	<code>&lt;conditionvar&gt;</code>
445	<code>&lt;varequal respident = "LID04"&gt;D&lt;/varequal&gt;</code>
446	<code>&lt;/conditionvar&gt;</code>
447	<code>&lt;setvar varname = "SCORE" action = "Add"&gt;1&lt;/setvar&gt;</code>
448	<code>&lt;displayfeedback linkrefid = "Correct" feedbacktype = "Response"/&gt;</code>
449	<code>&lt;/respcondition&gt;</code>
450	<code>&lt;respcondition continue = "No"&gt;</code>
451	<code>&lt;qticomment&gt;Incorrect response processing&lt;/qticomment&gt;</code>
452	<code>&lt;conditionvar&gt;</code>
453	<code>&lt;not&gt;</code>
454	<code>&lt;varequal respident = "LID04"&gt;D&lt;/varequal&gt;</code>
455	<code>&lt;/not&gt;</code>
456	<code>&lt;/conditionvar&gt;</code>
457	<code>&lt;displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/&gt;</code>
458	<code>&lt;/respcondition&gt;</code>
459	<code>&lt;/resprocessing&gt;</code>
460	<code>&lt;itemfeedback ident = "Correct" view = "All"&gt;</code>
461	<code>&lt;material&gt;</code>
462	<code>&lt;mattext&gt;Yes.&lt;/mattext&gt;</code>
463	<code>&lt;/material&gt;</code>
464	<code>&lt;/itemfeedback&gt;</code>
465	<code>&lt;itemfeedback ident = "Incorrect" view = "All"&gt;</code>
466	<code>&lt;material&gt;</code>
467	<code>&lt;mattext&gt;No. The atomic symbol for Silver is 'Ag'.&lt;/mattext&gt;</code>
468	<code>&lt;/material&gt;</code>
469	<code>&lt;/itemfeedback&gt;</code>
470	<code>&lt;/item&gt;</code>
471	<code>&lt;item ident = "IMS_QTIV1p2_I_QTILiveTalkv1_06" maxattempts = "2"&gt;</code>
472	<code>&lt;presentation&gt;</code>
473	<code>&lt;flow&gt;</code>
474	<code>&lt;material&gt;</code>

475	<code>&lt;mattext&gt;What is the atomic symbol for the common salt ?</code>
476	<code>&lt;/mattext&gt;</code>
477	<code>&lt;/material&gt;</code>
478	<code>&lt;response_lid id="LID03" rcardinality="Multiple" rtiming="No"&gt;</code>
479	<code>&lt;render_choice shuffle= "Yes" minnumber= "1" maxnumber= "1"&gt;</code>
480	<code>&lt;flow_label&gt;</code>
481	<code>&lt;response_label id = "A"&gt;</code>
482	<code>&lt;material&gt;</code>
483	<code>&lt;mattext&gt;CaCl&lt;/mattext&gt;</code>
484	<code>&lt;/material&gt;</code>
485	<code>&lt;/response_label&gt;</code>
486	<code>&lt;/flow_label&gt;</code>
487	<code>&lt;flow_label&gt;</code>
488	<code>&lt;response_label id = "B"&gt;</code>
489	<code>&lt;material&gt;</code>
490	<code>&lt;mattext&gt;NaCl&lt;/mattext&gt;</code>
491	<code>&lt;/material&gt;</code>
492	<code>&lt;/response_label&gt;</code>
493	<code>&lt;/flow_label&gt;</code>
494	<code>&lt;flow_label&gt;</code>
495	<code>&lt;response_label id = "C"&gt;</code>
496	<code>&lt;material&gt;</code>
497	<code>&lt;mattext&gt;CaBr&lt;/mattext&gt;</code>
498	<code>&lt;/material&gt;</code>
499	<code>&lt;/response_label&gt;</code>
500	<code>&lt;/flow_label&gt;</code>
501	<code>&lt;flow_label&gt;</code>
502	<code>&lt;response_label id = "D"&gt;</code>
503	<code>&lt;material&gt;</code>
504	<code>&lt;mattext&gt;NaBr&lt;/mattext&gt;</code>
505	<code>&lt;/material&gt;</code>
506	<code>&lt;/response_label&gt;</code>
507	<code>&lt;/flow_label&gt;</code>
508	<code>&lt;/render_choice&gt;</code>
509	<code>&lt;/response_lid&gt;</code>
510	<code>&lt;/flow&gt;</code>
511	<code>&lt;/presentation&gt;</code>
512	<code>&lt;resprocessing&gt;</code>
513	<code>&lt;outcomes&gt;</code>
514	<code>&lt;decvar varname = "SCORE" vartype = "Integer" defaultval = "0"</code>
515	<code>minvalue = "0" maxvalue = "1"/&gt;</code>
516	<code>&lt;/outcomes&gt;</code>
517	<code>&lt;respcondition&gt;</code>
518	<code>&lt;qticomment&gt;Correct response processing&lt;/qticomment&gt;</code>
519	<code>&lt;conditionvar&gt;</code>
520	<code>&lt;varequal respident = "LID03"&gt;B&lt;/varequal&gt;</code>
521	<code>&lt;/conditionvar&gt;</code>
522	<code>&lt;setvar varname = "SCORE" action = "Set"&gt;1&lt;/setvar&gt;</code>
523	<code>&lt;displayfeedback linkrefid = "Correct" feedbacktype= "Response"/&gt;</code>
524	<code>&lt;/respcondition&gt;</code>
525	<code>&lt;respcondition&gt;</code>
526	<code>&lt;qticomment&gt;Incorrect answer response processing&lt;/qticomment&gt;</code>
527	<code>&lt;conditionvar&gt;</code>
528	<code>&lt;not&gt;</code>
529	<code>&lt;varequal respident = "LID03"&gt;B&lt;/varequal&gt;</code>
530	<code>&lt;/not&gt;</code>
531	<code>&lt;/conditionvar&gt;</code>
532	<code>&lt;displayfeedback linkrefid="Incorrect" feedbacktype="Response"/&gt;</code>
533	<code>&lt;/respcondition&gt;</code>
534	<code>&lt;/resprocessing&gt;</code>

```

535         <itemfeedback ident = "Correct" view = "All">
536             <material>
537                 <mattext>Correct.</mattext>
538             </material>
539         </itemfeedback>
540         <itemfeedback ident = "Incorrect" view = "All">
541             <material>
542                 <mattext>No. The atomic symbol for common salt is 'NaCl'.
543             </mattext>
544             </material>
545         </itemfeedback>
546     </item>
547     <item ident = "IMS_QTIVlp2_I_SAO_07" maxattempts = "2">
548         <presentation>
549             <flow>
550                 <material>
551                     <mattext>'Fe' is the symbol for which element ?</mattext>
552                 </material>
553                 <response_lid ident="LID03" rcardinality="Multiple"
554                     rtiming = "No">
555                     <render_choice shuffle="Yes" minnumber= "1" maxnumber= "1">
556                         <flow_label>
557                             <response_label ident = "A">
558                                 <material>
559                                     <mattext>Gold</mattext>
560                                 </material>
561                             </response_label>
562                         </flow_label>
563                         <flow_label>
564                             <response_label ident = "B">
565                                 <material>
566                                     <mattext>Bronze</mattext>
567                                 </material>
568                             </response_label>
569                         </flow_label>
570                         <flow_label>
571                             <response_label ident = "C">
572                                 <material>
573                                     <mattext>Iron</mattext>
574                                 </material>
575                             </response_label>
576                         </flow_label>
577                         <flow_label>
578                             <response_label ident = "D">
579                                 <material>
580                                     <mattext>Mercury</mattext>
581                                 </material>
582                             </response_label>
583                         </flow_label>
584                     </render_choice>
585                 </response_lid>
586             </flow>
587         </presentation>
588         <resprocessing>
589             <outcomes>
590                 <decvar varname = "SCORE" vartype = "Integer" defaultval = "0"
591                     minvalue = "0" maxvalue = "1"/>
592             </outcomes>
593             <respcondition>
594                 <qticomment>Correct answer response processing.</qticomment>

```



595	<conditionvar>
596	<varequal respident = "LID03">C</varequal>
597	</conditionvar>
598	<setvar varname = "SCORE" action = "Set">1</setvar>
599	<displayfeedback linkrefid= "Correct" feedbacktype = "Response"/>
600	</respcondition>
601	<respcondition>
602	<qticomment>Incorrect answer response processing.</qticomment>
603	<conditionvar>
604	<not>
605	<varequal respident = "LID03">C</varequal>
606	</not>
607	</conditionvar>
608	<displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/>
609	</respcondition>
610	</resprocessing>
611	<itemfeedback ident = "Correct" view = "All">
612	<material>
613	<mattext>Correct.</mattext>
614	</material>
615	</itemfeedback>
616	<itemfeedback ident = "Incorrect" view = "All">
617	<material>
618	<mattext>No. 'Fe' is the atomic symbol for Iron.</mattext>
619	</material>
620	</itemfeedback>
621	</item>
622	<item ident = "IMS_QTIVlp2_I_SAO_08" maxattempts = "2">
623	<presentation>
624	<flow>
625	<material>
626	<mattext>Galium Arsenide is known as a III-V compound ?
627	</mattext>
628	</material>
629	<response_lid ident= "TF02" rcardinality= "Single" rtiming= "No">
630	<render_choice shuffle = "Yes">
631	<flow_label>
632	<response_label ident = "T">
633	<material>
634	<mattext>True</mattext>
635	</material>
636	</response_label>
637	</flow_label>
638	<flow_label>
639	<response_label ident = "F">
640	<material>
641	<mattext>False</mattext>
642	</material>
643	</response_label>
644	</flow_label>
645	</render_choice>
646	</response_lid>
647	</flow>
648	</presentation>
649	</resprocessing>
650	<qticomment>Processing for the correct answer.</qticomment>
651	<outcomes>
652	<decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
653	</outcomes>
654	</respcondition>

655	<conditionvar>
656	<varequal respident = "TF02">T</varequal>
657	</conditionvar>
658	<setvar action = "Set" varname = "SCORE">1</setvar>
659	<displayfeedback feedbacktype = "Response" linkrefid= "Correct"/>
660	</respcondition>
661	<respcondition continue = "No">
662	<conditionvar>
663	<varequal respident = "TF02" case = "No">F</varequal>
664	</conditionvar>
665	<displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/>
666	</respcondition>
667	</resprocessing>
668	<itemfeedback ident = "Correct">
669	<material>
670	<mattext>Correct answer.</mattext>
671	</material>
672	</itemfeedback>
673	<itemfeedback ident = "Incorrect">
674	<material>
675	<mattext>Incorrect. Galium Arsendie is a III-V compound.
676	</mattext>
677	</material>
678	</itemfeedback>
679	</item>
680	<item ident = "IMS_QTIVlp2_I_SAO_09" maxattempts = "2">
681	<presentation>
682	<flow>
683	<material>
684	<mattext>Six is the atomic weight of the element most
685	significant for the creation of on Earth ?
686	</mattext>
687	</material>
688	<response_lid ident= "TF03" rcardinality= "Single" rtiming= "No">
689	<render_choice shuffle = "Yes">
690	<flow_label>
691	<response_label ident = "T">
692	<material>
693	<mattext>True</mattext>
694	</material>
695	</response_label>
696	</flow_label>
697	<flow_label>
698	<response_label ident = "F">
699	<material>
700	<mattext>False</mattext>
701	</material>
702	</response_label>
703	</flow_label>
704	</render_choice>
705	</response_lid>
706	</flow>
707	</presentation>
708	<resprocessing>
709	<qticomment>Processing for the correct answer.</qticomment>
710	<outcomes>
711	<decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
712	</outcomes>
713	<respcondition>
714	<conditionvar>

```

715         <varequal respident = "TF03">T</varequal>
716     </conditionvar>
717     <setvar action = "Set" varname = "SCORE">1</setvar>
718     <displayfeedback feedbacktype = "Response" linkrefid= "Correct"/>
719 </respcondition>
720 <respcondition continue = "No">
721     <conditionvar>
722         <varequal respident = "TF03" case = "No">F</varequal>
723     </conditionvar>
724     <displayfeedback linkrefid="Incorrect" feedbacktype="Response"/>
725 </respcondition>
726 </resprocessing>
727 <itemfeedback ident = "Correct">
728     <material>
729         <mattext>Correct i.e. the element Carbon.</mattext>
730     </material>
731 </itemfeedback>
732 <itemfeedback ident = "Incorrect">
733     <material>
734         <mattext>Sorry, you are wrong. Carbon has an atomic weight of
735             six.
736         </mattext>
737     </material>
738 </itemfeedback>
739 </item>
740 <item ident = "IMS_QTIV1p2_I_SAO_10" maxattempts = "2">
741     <presentation>
742         <flow>
743             <material>
744                 <mattext>Is Lutetium the last element in the Lanthanide
745                     Series ?
746                 </mattext>
747             </material>
748             <response_lid ident="TF04" rcardinality= "Single" rtiming = "No">
749                 <render_choice shuffle = "Yes">
750                     <flow_label>
751                         <response_label ident = "T">
752                             <material>
753                                 <mattext>True</mattext>
754                             </material>
755                         </response_label>
756                     </flow_label>
757                     <flow_label>
758                         <response_label ident = "F">
759                             <material>
760                                 <mattext>False</mattext>
761                             </material>
762                         </response_label>
763                     </flow_label>
764                 </render_choice>
765             </response_lid>
766         </flow>
767     </presentation>
768     <resprocessing>
769         <qticomment>Processing for the correct answer.</qticomment>
770         <outcomes>
771             <decvar minvalue = "0" maxvalue = "1" defaultval = "0"/>
772         </outcomes>
773     </resprocessing>
774     <conditionvar>

```

775	<varequal respident = "TF04">T</varequal>
776	</conditionvar>
777	<setvar action = "Set" varname = "SCORE">1</setvar>
778	<displayfeedback feedbacktype= "Response" linkrefid = "Correct"/>
779	</respcondition>
780	<respcondition continue = "No">
781	<conditionvar>
782	<varequal respident = "TF04" case = "No">F</varequal>
783	</conditionvar>
784	<displayfeedback linkrefid="Incorrect" feedbacktype= "Response"/>
785	</respcondition>
786	</resprocessing>
787	<itemfeedback ident = "Correct">
788	<material>
789	<mattext>Correct answer.</mattext>
790	</material>
791	</itemfeedback>
792	<itemfeedback ident = "Incorrect">
793	<material>
794	<mattext>Sorry, you are wrong. Lutetium is the last element in
795	the Lathanide Series.
796	</mattext>
797	</material>
798	</itemfeedback>
799	</item>
800	</section>
801	</assessment>
802	</questestinterop>

The Result report of this Assessment assumes that the participant has entered the answer at the first attempt for all six of the presented Items. Five of the Items have been answered correctly.

1	<qti_result_report>
2	<result>
3	<context>
4	<name>Bruce Wayne</name>
5	<generic_identifier>
6	<type_label>Student Number</type_label>
7	<identifier_string>TestCo:156805D</identifier_string>
8	</generic_identifier>
9	<date>
10	<type_label>Exam</type_label>
11	<datetime>2001-08-07T14:00:00</datetime>
12	</date>
13	</context>
14	<assessment_result asi_title = "Example Assessment Title"
15	ident_ref = "IMS_QTIV1p2_A_ResReport_02">
16	<date>
17	<type_label>Assessment Creation Time</type_label>
18	<datetime>2001-08-07T13:30:00</datetime>
19	</date>
20	<duration>P0Y0M0DT1H0M</duration>
21	<control hint_switch = "No" solution_switch = "No" feedback_switch = "Yes"/>
22	<outcomes>
23	<score varname = "SCORE" vartype = "Integer">
24	<score_value>5</score_value>
25	<score_min>0</score_min>
26	<score_max>6</score_max>

27	<score_cut>4</score_cut>
28	</score>
29	</outcomes>
30	<feedback_displayed ident_ref = "Assess_Passed">Response
31	</feedback_displayed>
32	<num_items>10</num_items>
33	<num_sections>1</num_sections>
34	<num_items_presented>6</num_items_presented>
35	<num_items_attempted>6</num_items_attempted>
36	<num_sections_presented>1</num_sections_presented>
37	<section_result asi_title = "Example Section Title"
38	ident_ref = "IMS_QTIVlp2_S_ResReport_01">
39	<date>
40	<type_label>Section Creation Time</type_label>
41	<datetime>2001-08-07T13:30:00</datetime>
42	</date>
43	<control hint_switch= "No" solution_switch="No" feedback_switch= "Yes"/>
44	<outcomes>
45	<score varname = "SCORE" vartype = "Integer">
46	<score_value>5</score_value>
47	<score_min>0</score_min>
48	<score_max>6</score_max>
49	<score_cut>4</score_cut>
50	</score>
51	</outcomes>
52	<feedback_displayed ident_ref = "Section_Passed">Response
53	</feedback_displayed>
54	<num_items>10</num_items>
55	<num_items_presented>6</num_items_presented>
56	<num_items_attempted>6</num_items_attempted>
57	<num_sections_presented>1</num_sections_presented>
58	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_01">
59	<date>
60	<type_label>Item Creation Time</type_label>
61	<datetime>2001-08-07T13:31:00</datetime>
62	</date>
63	<duration>P0Y0M0DT0H2M</duration>
64	<response ident_ref = "LID01">
65	<response_form cardinality = "single" render_type = "choice"
66	timing = "No" response_type = "lid">
67	<correct_response>A</correct_response>
68	</response_form>
69	<num_attempts>1</num_attempts>
70	<response_value>A</response_value>
71	</response>
72	<outcomes>
73	<score varname = "SCORE" vartype = "Integer">
74	<score_value>1</score_value>
75	<score_min>0</score_min>
76	<score_max>1</score_max>
77	</score>
78	</outcomes>
79	<feedback_displayed ident_ref = "Correct">Response
80	</feedback_displayed>
81	</item_result>
82	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_02">
83	<date>
84	<type_label>Item Creation Time</type_label>
85	<datetime>2001-08-07T13:33:00</datetime>
86	</date>

87	<duration>P0Y0M0DT0H2M</duration>
88	<response ident_ref = "LID02">
89	<response_form cardinality = "single" render_type = "choice"
90	timing = "No" response_type = "lid">
91	<correct_response>B</correct_response>
92	</response_form>
93	<num_attempts>1</num_attempts>
94	<response_value>B</response_value>
95	</response>
96	<outcomes>
97	<score varname = "SCORE" vartype = "Integer">
98	<score_value>1</score_value>
99	<score_min>0</score_min>
100	<score_max>1</score_max>
101	</score>
102	</outcomes>
103	<feedback_displayed ident_ref = "Correct">Response
104	</feedback_displayed>
105	</item_result>
106	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_03" presented = "No">
107	<date>
108	<type_label>Item Creation Time</type_label>
109	<datetime>2001-08-07T13:35:00</datetime>
110	</date>
111	<duration>P0Y0M0DT0H2M</duration>
112	<response ident_ref = "TF01">
113	<response_form cardinality = "single" render_type = "choice"
114	timing = "No" response_type = "lid">
115	<correct_response>C</correct_response>
116	</response_form>
117	</response>
118	</item_result>
119	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_04" presented = "Yes">
120	<date>
121	<type_label>Item Creation Time</type_label>
122	<datetime>2001-08-07T13:37:00</datetime>
123	</date>
124	<duration>P0Y0M0DT0H2M</duration>
125	<response ident_ref = "LID03">
126	<response_form cardinality = "single" render_type = "choice"
127	timing = "No" response_type = "lid">
128	<correct_response>A</correct_response>
129	</response_form>
130	<num_attempts>1</num_attempts>
131	<response_value response_status = "Valid">D</response_value>
132	</response>
133	<outcomes>
134	<score varname = "SCORE" vartype = "Integer" status = "Valid">
135	<score_value>0</score_value>
136	<score_min>0</score_min>
137	<score_max>1</score_max>
138	</score>
139	</outcomes>
140	<feedback_displayed ident_ref = "Incorrect">Response
141	</feedback_displayed>
142	</item_result>
143	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_05" presented = "Yes">
144	<date>
145	<type_label>Item Creation Time</type_label>
146	<datetime>2001-08-07T13:39:00</datetime>

147	</date>
148	<duration>P0Y0M0DT0H2M</duration>
149	<response ident_ref = "LID04">
150	<response_form cardinality = "single" render_type = "choice"
151	timing = "No" response_type = "lid">
152	<correct_response>D</correct_response>
153	</response_form>
154	<num_attempts>1</num_attempts>
155	<response_value response_status = "Valid">D</response_value>
156	</response>
157	<outcomes>
158	<score varname = "SCORE" vartype = "Integer" status = "Valid">
159	<score_value>1</score_value>
160	<score_min>0</score_min>
161	<score_max>1</score_max>
162	</score>
163	</outcomes>
164	<feedback_displayed ident_ref = "Correct">Response
165	</feedback_displayed>
166	</item_result>
167	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_06" presented = "No">
168	<date>
169	<type_label>Item Creation Time</type_label>
170	<datetime>2001-08-07T13:41:00</datetime>
171	</date>
172	<duration>P0Y0M0DT0H2M</duration>
173	<response ident_ref = "LID03">
174	<response_form cardinality = "single" render_type = "choice"
175	timing = "No" response_type = "lid">
176	<correct_response>B</correct_response>
177	</response_form>
178	</response>
179	</item_result>
180	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_07" presented = "Yes">
181	<date>
182	<type_label>Item Creation Time</type_label>
183	<datetime>2001-08-07T13:42:00</datetime>
184	</date>
185	<duration>P0Y0M0DT0H2M</duration>
186	<response ident_ref = "LID03">
187	<response_form cardinality = "single" render_type = "choice"
188	timing = "No" response_type = "lid">
189	<correct_response>C</correct_response>
190	</response_form>
191	<num_attempts>1</num_attempts>
192	<response_value response_status = "Valid">C</response_value>
193	</response>
194	<outcomes>
195	<score varname = "SCORE" vartype = "Integer" status = "Valid">
196	<score_value>1</score_value>
197	<score_min>0</score_min>
198	<score_max>1</score_max>
199	</score>
200	</outcomes>
201	<feedback_displayed ident_ref = "Correct">Response
202	</feedback_displayed>
203	</item_result>
204	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_08" presented = "No">
205	<date>
206	<type_label>Item Creation Time</type_label>

207	<datetime>2001-08-07T13:43:00</datetime>
208	</date>
209	<duration>P0Y0M0DT0H2M</duration>
210	<response ident_ref = "TF02">
211	<response_form cardinality = "single" render_type = "choice"
212	timing = "No" response_type = "lid">
213	<correct_response>T</correct_response>
214	</response_form>
215	</response>
216	</item_result>
217	<item_result ident_ref = "IMS_QTIV1p2_I_SAO_09" presented = "Yes">
218	<date>
219	<type_label>Item Creation Time</type_label>
220	<datetime>2001-08-07T13:44:00</datetime>
221	</date>
222	<duration>P0Y0M0DT0H2M</duration>
223	<response ident_ref = "TF03">
224	<response_form cardinality = "single" render_type = "choice"
225	timing = "No" response_type = "lid">
226	<correct_response>T</correct_response>
227	</response_form>
228	<num_attempts>1</num_attempts>
229	<response_value response_status = "Valid">T</response_value>
230	</response>
231	<outcomes>
232	<score varname = "SCORE" vartype = "Integer" status = "Valid">
233	<score_value>1</score_value>
234	<score_min>0</score_min>
235	<score_max>1</score_max>
236	</score>
237	</outcomes>
238	<feedback_displayed ident_ref = "Correct">Response
239	</feedback_displayed>
240	</item_result>
241	<item_result ident_ref = "IMS_QTIV1p2_I_SAO_10" presented = "No">
242	<date>
243	<type_label>Item Creation Time</type_label>
244	<datetime>2001-08-07T13:43:00</datetime>
245	</date>
246	<duration>P0Y0M0DT0H2M</duration>
247	<response ident_ref = "TF04">
248	<response_form cardinality = "single" render_type = "choice"
249	timing = "No" response_type = "lid">
250	<correct_response>T</correct_response>
251	</response_form>
252	</response>
253	</item_result>
254	</section_result>
255	</assessment_result>
256	</result>
257	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_sc\_assess02.xml'. The key points to note are:

- There is an Item result report for ALL of the Items. Items that were not presented are denoted using the attribute value *presented='No'* on the *item\_result* element;
- The Section and Item summaries given in the section\_result element shown that the Assessment contains 10 Items of which 6 were presented and attempted, from the 1 presented Section (lines 32-36);



- The correct response has been returned for all of the Items. The manner in which this is derived from the original ASI structure is outside the scope of this specification.

## 4.4 Reporting Result Summaries

### 4.4.1 Summary of a Section

The Result report of this Summary is based upon the Section example in Section 4.2.

1	<qti_result_report>
2	<result>
3	<context>
4	<name>Bruce Wayne</name>
5	<generic_identifier>
6	<type_label>Student Number</type_label>
7	<identifier_string>TestCo:156805D</identifier_string>
8	</generic_identifier>
9	<date>
10	<type_label>Exam</type_label>
11	<datetime>2001-08-07T00:14:00</datetime>
12	</date>
13	</context>
14	<summary_result>
15	<type_label>Section</type_label>
16	<generic_identifier>
17	<type_label>Section Id</type_label>
18	<identifier_string>IMS_QTIVlp2_S_ResReport_01</identifier_string>
19	</generic_identifier>
20	<date>
21	<type_label>Section Creation Time</type_label>
22	<datetime>2001-08-07T13:40:00</datetime>
23	</date>
24	<status>
25	<status_value>Complete</status_value>
26	</status>
27	<duration>P0Y0M0DT1H0M0S</duration>
28	<score varname = "SCORE" vartype = "Integer">
29	<score_value>5</score_value>
30	<score_min>0</score_min>
31	<score_max>6</score_max>
32	<score_cut>4</score_cut>
33	</score>
34	</summary_result>
35	</result>
36	</qti_result_report>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_ss\_sectsummary01.xml'. The key points to note are:

- There is no reporting structure that reflects the structure of the original Section and its 10 Items;
- The original Section is identified using the <type\_label> and <generic\_identifier> mechanism (lines 15-19);
- The scores reported from the Section are contained in lines 28-33.

### 4.4.2 Summary of an Assessment

The Result report of this Summary is based upon the Assessment example in Section 4.3.

1	<qti_result_report>
2	<result>
3	<context>
4	<name>Bruce Wayne</name>
5	<generic_identifier>
6	<type_label>Student Number</type_label>
7	<identifier_string>TestCo:156805D</identifier_string>
8	</generic_identifier>
9	<date>
10	<type_label>Exam</type_label>
11	<datetime>2001-08-07T00:14:00</datetime>
12	</date>
13	</context>
14	<summary_result>
15	<type_label>Assessment</type_label>
16	<generic_identifier>
17	<type_label>Assessment Id</type_label>
18	<identifier_string>IMS_QTIVlp2_A_ResReport_02</identifier_string>
19	</generic_identifier>
20	<date>
21	<type_label>Assessment Creation Time</type_label>
22	<datetime>2001-08-07T13:30:00</datetime>
23	</date>
24	<status>
25	<status_value>Complete</status_value>
26	</status>
27	<duration>P0Y0M0DT1H0M</duration>
28	<score varname = "SCORE" vartype = "Integer">
29	<score_value>5</score_value>
30	<score_min>0</score_min>
31	<score_max>6</score_max>
32	<score_cut>4</score_cut>
33	</score>
34	</summary_result>
35	</result>
36	</qti_result_report>

This example is available in the file: 'ims\_qtiresvlp2/item/qtires\_ss\_assesssummary01.xml'. The key points to note are:

- There is no reporting structure that reflects the structure of the original Assessment, the Section and its 10 Items;
- The original Assessment is identified using the <type\_label> and <generic\_identifier> mechanism (lines 15-19);
- The scores reported from the Assessment are contained in lines 28-33.

## 5. Advanced XML Instance Examples

### 5.1 Complex Assessments

Below is an example of a complex Assessment consisting of two Sections each of which consist of two Sections and contain a total of 20 Items with QTI-XML and the associated Results Reporting structure required to report on an instance of that Assessment being answered and reported.

1	<questestinterop>
2	<assessment ident = "IMS_QTIV1p2_A_SAO_01">
3	<outcomes_processing scoremodel = "SumofScores">
4	<outcomes>
5	<decvar vartype="Integer" varname="SCORE" defaultval= "0" minvalue= "0"
6	maxvalue = "18" cutvalue = "14"/>
7	</outcomes>
8	<outcomes_feedback_test title = "Pass test.">
9	<test_variable>
10	<variable_test testoperator="GTE" varname= "SCORE">14
11	</variable_test>
12	</test_variable>
13	<displayfeedback linkrefid = "Pass" feedbacktype = "Response"/>
14	</outcomes_feedback_test>
15	<outcomes_feedback_test title = "Fail test.">
16	<test_variable>
17	<variable_test testoperator = "LT" varname = "SCORE">14
18	</variable_test>
19	</test_variable>
20	<displayfeedback linkrefid = "Fail" feedbacktype = "Response"/>
21	</outcomes_feedback_test>
22	</outcomes_processing>
23	<outcomes_processing scoremodel = "NumberCorrect">
24	<outcomes>
25	<decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
26	minvalue = "0" maxvalue = "18" cutvalue = "14"/>
27	</outcomes>
28	<outcomes_feedback_test title = "Pass test.">
29	<test_variable>
30	<variable_test testoperator = "GTE" varname = "SCORE">14
31	</variable_test>
32	</test_variable>
33	<displayfeedback linkrefid = "Pass" feedbacktype = "Response"/>
34	</outcomes_feedback_test>
35	<outcomes_feedback_test title = "Fail test.">
36	<test_variable>
37	<variable_test testoperator = "LT" varname = "SCORE">14
38	</variable_test>
39	</test_variable>
40	<displayfeedback linkrefid = "Fail" feedbacktype = "Response"/>
41	</outcomes_feedback_test>
42	</outcomes_processing>
43	<assessfeedback ident = "Pass" view = "All">
44	<flow_mat>
45	<material>
46	<mattext>Well done. You have passed this test.</mattext>
47	</material>
48	</flow_mat>
49	</assessfeedback>
50	<assessfeedback ident = "Fail" view = "All">

```

51      <flow_mat>
52          <material>
53              <mattext>Sorry, You have failed this test.</mattext>
54          </material>
55      </flow_mat>
56  </assessfeedback>
57  <selection_ordering>
58      <selection>
59          <selection_number>1</selection_number>
60      </selection>
61      <order order_type = "Random"/>
62  </selection_ordering>
63  <section ident = "IMS_QTIVlp2_S_SAO_11">
64      <outcomes_processing scoremodel = "SumofScores">
65          <outcomes>
66              <decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
67                  minvalue = "0" maxvalue = "10" cutvalue = "8"/>
68          </outcomes>
69      </outcomes_processing>
70      <outcomes_processing scoremodel = "NumberCorrect">
71          <outcomes>
72              <decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
73                  minvalue = "0" maxvalue = "10" cutvalue = "8"/>
74          </outcomes>
75      </outcomes_processing>
76      <selection_ordering>
77          <selection>
78              <selection_metadata mdname= "qmd_numberofitems" mdoperator = "GTE">4
79          </selection_metadata>
80          </selection>
81          <order order_type = "Sequential"/>
82      </selection_ordering>
83      <section title = "IMSQTI_Selection&OrderingTest_S11p1"
84          ident = "IMS_QTIVlp2_S_SAO_11p1">
85          <qticomment>Set of True/false questions</qticomment>
86          <qtimetadadata>
87              <qtimetadadatafield>
88                  <fieldlabel>qmd_numberofitems</fieldlabel>
89                  <fieldentry>4</fieldentry>
90              </qtimetadadatafield>
91          </qtimetadadata>
92          <outcomes_processing scoremodel = "SumofScores">
93              <outcomes>
94                  <decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
95                      minvalue = "0" maxvalue = "4" cutvalue = "3"/>
96              </outcomes>
97          </outcomes_processing>
98          <outcomes_processing scoremodel = "NumberCorrect">
99              <outcomes>
100                  <decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
101                      minvalue = "0" maxvalue = "4" cutvalue = "3"/>
102              </outcomes>
103          </outcomes_processing>
104          <selection_ordering>
105              <selection/>
106              <order order_type = "Random"/>
107          </selection_ordering>
108          <item ident = "IMS_QTIVlp2_I_SAO_02" maxattempts = "2">
109              <itemmetadata>
110                  <qtimetadadata>

```

111	<qtimetadafield>
112	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
113	<fieldentry>basic</fieldentry>
114	</qtimetadafield>
115	<qtimetadafield>
116	<fieldlabel>qmd_topic</fieldlabel>
117	<fieldentry>qativlp2test</fieldentry>
118	</qtimetadafield>
119	</qtimetadata>
120	</itemmetadata>
121	<presentation>
122	<flow class = "Block">
123	<material>
124	<mattext>The QTI specification supports the exchange of
125	which data structures ?
126	</mattext>
127	</material>
128	<response_lid ident = "LID02" rcardinality = "Multiple"
129	rtiming = "No">
130	<render_choice shuffle = "Yes" minnumber = "1"
131	maxnumber = "2">
132	<flow_label class = "Block">
133	<response_label ident = "A">
134	<material>
135	<mattext>Response</mattext>
136	</material>
137	</response_label>
138	</flow_label>
139	<flow_label class = "Block">
140	<response_label ident = "B">
141	<material>
142	<mattext>Question</mattext>
143	</material>
144	</response_label>
145	</flow_label>
146	<flow_label class = "Block">
147	<response_label ident = "C">
148	<material>
149	<mattext>Item</mattext>
150	</material>
151	</response_label>
152	</flow_label>
153	<flow_label class = "Block">
154	<response_label ident = "D">
155	<material>
156	<mattext>Assessment</mattext>
157	</material>
158	</response_label>
159	</flow_label>
160	</render_choice>
161	</response_lid>
162	</flow>
163	</presentation>
164	<resprocessing>
165	<outcomes>
166	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
167	maxvalue = "1" defaultval = "0"/>
168	<decvar varname = "CORRECT" vartype = "Boolean" defaultval =
169	"False"/>
170	</outcomes>

171	<respcondition continue = "No">
172	<qticomment xml:lang = "en-US">Correct response detection
173	</qticomment>
174	<conditionvar>
175	<varequal respident = "LID02" case = "No">A</varequal>
176	<varequal respident = "LID02" case = "No">B</varequal>
177	<not>
178	<varequal respident = "LID02" case = "No">C
179	</varequal>
180	</not>
181	<not>
182	<varequal respident = "LID02" case = "No">D
183	</varequal>
184	</not>
185	</conditionvar>
186	<setvar varname = "SCORE" action = "Set">1</setvar>
187	<setvar varname = "CORRECT" action = "Set">True</setvar>
188	<displayfeedback linkrefid = "Correct"
189	feedbacktype = "Response"/>
190	</respcondition>
191	<respcondition continue = "No">
192	<conditionvar>
193	<not>
194	<and>
195	<varequal respident = "LID02" case = "No">A
196	</varequal>
197	<varequal respident = "LID02" case = "No">B
198	</varequal>
199	<not>
200	<varequal respident = "LID02" case = "No">C
201	</varequal>
202	</not>
203	<not>
204	<varequal respident = "LID02" case = "No">D
205	</varequal>
206	</not>
207	</and>
208	</not>
209	</conditionvar>
210	<displayfeedback linkrefid = "Incorrect"
211	feedbacktype = "Response"/>
212	</respcondition>
213	</resprocessing>
214	<itemfeedback ident = "Correct" view = "All">
215	<material>
216	<mattext>Correct. Items and Assessment.</mattext>
217	</material>
218	</itemfeedback>
219	<itemfeedback ident = "Incorrect" view = "All">
220	<material>
221	<mattext>No. The correct answers are Item and Assessment.
222	</mattext>
223	</material>
224	</itemfeedback>
225	</item>
226	<item ident = "IMS_QTIVlp2_I_SAO_08" maxattempts = "2">
227	<itemmetadata>
228	<qtimetadata>
229	<qtimetadatafield>
230	<fieldlabel>qmd_levelofdifficulty</fieldlabel>

```

231         <fieldentry>basic</fieldentry>
232     </qtimetadadatafield>
233     <qtimetadadatafield>
234         <fieldlabel>qmd_topic</fieldlabel>
235         <fieldentry>qativlp2test</fieldentry>
236     </qtimetadadatafield>
237 </qtimetadadata>
238 </itemmetadata>
239 <presentation>
240     <flow class = "Block">
241         <material>
242             <mattext>Time-based responses are supported by the QTI
243                 specification.</mattext>
244         </material>
245         <response_lid ident = "TF02" rcardinality = "Single"
246             rtiming = "No">
247             <render_choice shuffle = "Yes">
248                 <flow_label class = "Block">
249                     <response_label ident = "T">
250                         <material>
251                             <mattext>True</mattext>
252                         </material>
253                     </response_label>
254                 </flow_label>
255                 <flow_label class = "Block">
256                     <response_label ident = "F">
257                         <material>
258                             <mattext>False</mattext>
259                         </material>
260                     </response_label>
261                 </flow_label>
262             </render_choice>
263         </response_lid>
264     </flow>
265 </presentation>
266 <resprocessing>
267     <qticomment>Processing for the correct answer.</qticomment>
268     <outcomes>
269         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
270             maxvalue = "1" defaultval = "0"/>
271         <decvar varname = "CORRECT" vartype = "Boolean"
272             defaultval = "False"/>
273     </outcomes>
274     <respcondition continue = "No">
275         <conditionvar>
276             <varequal respident = "TF02" case = "No">T</varequal>
277         </conditionvar>
278         <setvar action = "Set" varname = "SCORE">1</setvar>
279         <setvar varname = "CORRECT" action = "Set">True</setvar>
280         <displayfeedback feedbacktype = "Response"
281             linkrefid = "Correct"/>
282     </respcondition>
283     <respcondition continue = "No">
284         <conditionvar>
285             <varequal respident = "TF02" case = "No">F</varequal>
286         </conditionvar>
287         <displayfeedback linkrefid = "Incorrect"
288             feedbacktype = "Response"/>
289     </respcondition>
290 </resprocessing>

```

291	<itemfeedback ident = "Correct" view = "All">
292	<material>
293	<mattext>Correct answer.</mattext>
294	</material>
295	</itemfeedback>
296	<itemfeedback ident = "Incorrect" view = "All">
297	<material>
298	<mattext>Sorry, you are wrong. Time-based reponses ARE
299	supported by the specification.
300	</mattext>
301	</material>
302	</itemfeedback>
303	</item>
304	<item ident = "IMS_QTIVlp2_I_SAO_09" maxattempts = "2">
305	<itemmetadata>
306	<qtimetadadata>
307	<qtimetadadatafield>
308	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
309	<fieldentry>advanced</fieldentry>
310	</qtimetadadatafield>
311	<qtimetadadatafield>
312	<fieldlabel>qmd_topic</fieldlabel>
313	<fieldentry>qtivlp2test</fieldentry>
314	</qtimetadadatafield>
315	</qtimetadadata>
316	</itemmetadata>
317	<presentation>
318	<flow class = "Block">
319	<material>
320	<mattext>Items defined according to QTI V1.0 are not
321	compatible with Items from QTI V1.2.
322	</mattext>
323	</material>
324	<response_lid ident = "TF03" rcardinality = "Single"
325	rtiming = "No">
326	<render_choice shuffle = "Yes">
327	<flow_label class = "Block">
328	<response_label ident = "T">
329	<material>
330	<mattext>True</mattext>
331	</material>
332	</response_label>
333	</flow_label>
334	<flow_label class = "Block">
335	<response_label ident = "F">
336	<material>
337	<mattext>False</mattext>
338	</material>
339	</response_label>
340	</flow_label>
341	</render_choice>
342	</response_lid>
343	</flow>
344	</presentation>
345	<resprocessing>
346	<qticomment>Processing for the correct answer.</qticomment>
347	<outcomes>
348	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
349	maxvalue = "1" defaultval = "0"/>
350	<decvar varname = "CORRECT" vartype = "Boolean"



```

351         defaultval = "False"/>
352     </outcomes>
353     <respcondition continue = "No">
354         <conditionvar>
355             <varequal respident = "TF03" case = "No">F</varequal>
356         </conditionvar>
357         <setvar varname = "SCORE" action = "Set">1</setvar>
358         <setvar varname = "CORRECT" action = "Set">True</setvar>
359         <displayfeedback feedbacktype = "Response"
360             linkrefid = "Correct"/>
361     </respcondition>
362     <respcondition continue = "No">
363         <conditionvar>
364             <varequal respident = "TF03" case = "No">T</varequal>
365         </conditionvar>
366         <displayfeedback linkrefid = "Incorrect"
367             feedbacktype = "Response"/>
368     </respcondition>
369 </resprocessing>
370 <itemfeedback ident = "Correct" view = "All">
371     <material>
372         <mattext>Correct answer.</mattext>
373     </material>
374 </itemfeedback>
375 <itemfeedback ident = "Incorrect" view = "All">
376     <material>
377         <mattext>Sorry, you are wrong. V1.0 Items ARE compatible
378             with the V1.2 specification.
379     </mattext>
380 </material>
381 </itemfeedback>
382 </item>
383 <item ident = "IMS_QTIVlp2_I_SAO_10" maxattempts = "2">
384     <itemmetadata>
385         <qtimetadata>
386             <qtimetadatafield>
387                 <fieldlabel>qmd_levelofdifficulty</fieldlabel>
388                 <fieldentry>advanced</fieldentry>
389             </qtimetadatafield>
390             <qtimetadatafield>
391                 <fieldlabel>qmd_topic</fieldlabel>
392                 <fieldentry>qtivlp2test</fieldentry>
393             </qtimetadatafield>
394         </qtimetadata>
395     </itemmetadata>
396     <presentation>
397         <flow class = "Block">
398             <material>
399                 <mattext>The QTI specification is used within the ADL
400                     SCORM.
401             </mattext>
402             </material>
403             <response_lid ident = "TF04" rcardinality = "Single"
404                 rtiming = "No">
405                 <render_choice shuffle = "Yes">
406                     <flow_label class = "Block">
407                         <response_label ident = "T">
408                             <material>
409                                 <mattext>True</mattext>
410                             </material>

```

```

411         </response_label>
412     </flow_label>
413     <flow_label class = "Block">
414         <response_label ident = "F">
415             <material>
416                 <mattext>False</mattext>
417             </material>
418         </response_label>
419     </flow_label>
420 </render_choice>
421 </response_lid>
422 </flow>
423 </presentation>
424 <resprocessing>
425     <qticomment>Processing for the correct answer.</qticomment>
426     <outcomes>
427         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
428             maxvalue = "1" defaultval = "0"/>
429         <decvar varname = "CORRECT" vartype = "Boolean"
430             defaultval = "False"/>
431     </outcomes>
432     <respcondition continue = "No">
433         <conditionvar>
434             <varequal respident = "TF04" case = "No">T</varequal>
435         </conditionvar>
436         <setvar varname = "SCORE" action = "Set">1</setvar>
437         <setvar varname = "CORRECT" action = "Set">True</setvar>
438         <displayfeedback feedbacktype = "Response"
439             linkrefid = "Correct"/>
440     </respcondition>
441     <respcondition continue = "No">
442         <conditionvar>
443             <varequal respident = "TF04" case = "No">F</varequal>
444         </conditionvar>
445         <displayfeedback linkrefid = "Incorrect"
446             feedbacktype = "Response"/>
447     </respcondition>
448 </resprocessing>
449 <itemfeedback ident = "Correct" view = "All">
450     <material>
451         <mattext>Correct answer.</mattext>
452     </material>
453 </itemfeedback>
454 <itemfeedback ident = "Incorrect" view = "All">
455     <material>
456         <mattext>Sorry, you are wrong. The QTI specification is NOT
457             used within ADL SCORM.
458         </mattext>
459     </material>
460 </itemfeedback>
461 </item>
462 </section>
463 <section title = "IMSQTI_Selection&OrderingTest_S1lp2"
464     ident = "IMS_QTIVlp2_S_SAO_1lp2">
465     <qticomment>Set of multiple-choice/multiple-response questions
466     </qticomment>
467     <qtimetadata>
468         <qtimetadatafield>
469             <fieldlabel>qmd_numberofitems</fieldlabel>
470             <fieldentry>4</fieldentry>

```

471	</qtimetadafield>
472	</qtimetadata>
473	<outcomes_processing scoremodel = "SumofScores">
474	<outcomes>
475	<decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
476	minvalue = "0" maxvalue = "6" cutvalue = "5"/>
477	</outcomes>
478	</outcomes_processing>
479	<outcomes_processing scoremodel = "NumberCorrect">
480	<outcomes>
481	<decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
482	minvalue = "0" maxvalue = "6" cutvalue = "5"/>
483	</outcomes>
484	</outcomes_processing>
485	<selection_ordering>
486	<selection/>
487	<order order_type = "Random"/>
488	</selection_ordering>
489	<item ident = "IMS_QTIVlp2_I_SAO_01" maxattempts = "2">
490	<itemmetadata>
491	<qtimetadata>
492	<qtimetadafield>
493	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
494	<fieldentry>advanced</fieldentry>
495	</qtimetadafield>
496	<qtimetadafield>
497	<fieldlabel>qmd_topic</fieldlabel>
498	<fieldentry>qtivlp2test</fieldentry>
499	</qtimetadafield>
500	</qtimetadata>
501	</itemmetadata>
502	<presentation>
503	<flow class = "Block">
504	<material>
505	<mattext>Which of the following statements are true about
506	the QTI specification ?
507	</mattext>
508	</material>
509	<response_lid ident = "LID01" rcardinality = "Multiple"
510	rtiming = "No">
511	<render_choice shuffle="Yes" minnumber="1"
512	maxnumber= "5">
513	<flow_label class = "Block">
514	<response_label ident = "A">
515	<material>
516	<mattext>It is independent of pedagogy
517	</mattext>
518	</material>
519	</response_label>
520	</flow_label>
521	<flow_label class = "Block">
522	<response_label ident = "B">
523	<material>
524	<mattext>It cannot be extended to support
525	proprietary features
526	</mattext>
527	</material>
528	</response_label>
529	</flow_label>
530	<flow_label class = "Block">

531	<response_label ident = "C">
532	<material>
533	<mattext>It contains many unnecessary
534	features
535	</mattext>
536	</material>
537	</response_label>
538	</flow_label>
539	<flow_label class = "Block">
540	<response_label ident = "D">
541	<material>
542	<mattext>It provides different content
543	views for different types of
544	participants
545	</mattext>
546	</material>
547	</response_label>
548	</flow_label>
549	<flow_label class = "Block">
550	<response_label ident = "E">
551	<material>
552	<mattext>It is based on a well established
553	framework
554	</mattext>
555	</material>
556	</response_label>
557	</flow_label>
558	</render_choice>
559	</response_lid>
560	</flow>
561	</presentation>
562	<resprocessing>
563	<qticomment xml:lang = "en-US"/>
564	<outcomes>
565	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
566	maxvalue = "1" defaultval = "0"/>
567	<decvar varname = "CORRECT" vartype = "Boolean"
568	defaultval = "False"/>
569	</outcomes>
570	<respcondition continue = "Yes">
571	<qticomment>To detect if the correct answer has been
572	supplied.
573	</qticomment>
574	<conditionvar>
575	<varequal respident = "LID01" case = "No">A</varequal>
576	<not>
577	<varequal respident = "LID01" case = "No">B
578	</varequal>
579	</not>
580	<not>
581	<varequal respident = "LID01" case = "No">C
582	</varequal>
583	</not>
584	<varequal respident = "LID01" case = "No">D</varequal>
585	<varequal respident = "LID01" case = "No">E</varequal>
586	</conditionvar>
587	<setvar varname = "SCORE" action = "Set">1</setvar>
588	<setvar varname = "CORRECT" action = "Set">True</setvar>
589	<displayfeedback feedbacktype = "Response"
590	linkrefid = "Correct"/>

591	</respcondition>
592	<respcondition continue = "No">
593	<qticomment>To detect if the incorrect answer is supplied.
594	</qticomment>
595	<conditionvar>
596	<not>
597	<and>
598	<varequal respident = "LID01" case = "No">A
599	</varequal>
600	<not>
601	<varequal respident = "LID01" case = "No">B
602	</varequal>
603	</not>
604	<not>
605	<varequal respident = "LID01" case = "No">C
606	</varequal>
607	</not>
608	<varequal respident = "LID01" case = "No">D
609	</varequal>
610	<varequal respident = "LID01" case = "No">E
611	</varequal>
612	</and>
613	</not>
614	</conditionvar>
615	<displayfeedback feedbacktype = "Response"
616	linkrefid = "InCorrect"/>
617	</respcondition>
618	</resprocessing>
619	<itemfeedback ident = "Correct" view = "All">
620	<material>
621	<mattext>Correct answer is A, D, E.</mattext>
622	</material>
623	</itemfeedback>
624	<itemfeedback ident = "Incorrect" view = "All">
625	<material>
626	<mattext>Answers B and C are incorrect.</mattext>
627	</material>
628	</itemfeedback>
629	</item>
630	<item ident = "IMS_QTIVlp2_I_SAO_03" maxattempts = "2">
631	<itemmetadata>
632	<qtimetadata>
633	<qtimedatafield>
634	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
635	<fieldentry>basic</fieldentry>
636	</qtimedatafield>
637	<qtimedatafield>
638	<fieldlabel>qmd_topic</fieldlabel>
639	<fieldentry>qtivlp2test</fieldentry>
640	</qtimedatafield>
641	</qtimetadata>
642	</itemmetadata>
643	<presentation>
644	<flow class = "Block">
645	<material>
646	<mattext>Multiple Assessments cannot be contained in a
647	single QTI ASI XML instance.
648	</mattext>
649	</material>
650	<response_lid ident = "TF01" rcardinality = "Single"

```

651         rtiming = "No">
652         <render_choice shuffle = "Yes">
653             <flow_label class = "Block">
654                 <response_label ident = "T">
655                     <material>
656                         <mattext>True</mattext>
657                     </material>
658                 </response_label>
659             </flow_label>
660             <flow_label class = "Block">
661                 <response_label ident = "F">
662                     <material>
663                         <mattext>False</mattext>
664                     </material>
665                 </response_label>
666             </flow_label>
667         </render_choice>
668     </response_lid>
669 </flow>
670 </presentation>
671 <resprocessing>
672     <qticomment>Processing for the incorrect answer.</qticomment>
673     <outcomes>
674         <decvar minvalue = "0" maxvalue = "1" defaultval = "0"
675             vartype = "Integer" varname = "SCORE"/>
676     </outcomes>
677     <respcondition continue = "No">
678         <conditionvar>
679             <varequal respident = "TF01" case = "No">T</varequal>
680         </conditionvar>
681         <displayfeedback feedbacktype = "Response"
682             linkrefid = "Incorrect"/>
683     </respcondition>
684     <respcondition continue = "No">
685         <conditionvar>
686             <varequal respident = "TF01" case = "No">F</varequal>
687         </conditionvar>
688         <setvar varname = "SCORE" action = "Set">1</setvar>
689         <setvar varname = "CORRECT" action = "Set">True</setvar>
690         <displayfeedback linkrefid = "Correct"
691             feedbacktype = "Response"/>
692     </respcondition>
693 </resprocessing>
694 <itemfeedback ident = "Correct" view = "All">
695     <material>
696         <mattext>Correct answer.</mattext>
697     </material>
698 </itemfeedback>
699 <itemfeedback ident = "Incorrect" view = "All">
700     <material>
701         <mattext>Sorry, you are wrong. A QTI-XML instance CAN
702             contain multiple Assessments.
703         </mattext>
704     </material>
705 </itemfeedback>
706 </item>
707 <item ident = "IMS_QTIVlp2_I_SAO_04" maxattempts = "2">
708     <itemmetadata>
709         <qtimetadata>
710             <qtimetadafield>

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711	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
712	<fieldentry>advanced</fieldentry>
713	</qtimetadafield>
714	<qtimetadafield>
715	<fieldlabel>qmd_topic</fieldlabel>
716	<fieldentry>qativlp2test</fieldentry>
717	</qtimetadafield>
718	</qtimetadafield>
719	</itemmetadata>
720	<presentation>
721	<flow class = "Block">
722	<material>
723	<mattext>Which one of the following data structures is
724	used to provide hierarchically structured
725	assessments?
726	</mattext>
727	</material>
728	<response_lid ident = "LID03" rcardinality = "Single"
729	rtiming = "No">
730	<render_choice shuffle = "Yes">
731	<flow_label class = "Block">
732	<response_label ident = "A">
733	<material>
734	<mattext>Assessment</mattext>
735	</material>
736	</response_label>
737	</flow_label>
738	<flow_label class = "Block">
739	<response_label ident = "B">
740	<material>
741	<mattext>Section</mattext>
742	</material>
743	</response_label>
744	</flow_label>
745	<flow_label class = "Block">
746	<response_label ident = "C">
747	<material>
748	<mattext>Item</mattext>
749	</material>
750	</response_label>
751	</flow_label>
752	<flow_label class = "Block">
753	<response_label ident = "D">
754	<material>
755	<mattext>Question</mattext>
756	</material>
757	</response_label>
758	</flow_label>
759	</render_choice>
760	</response_lid>
761	</flow>
762	</presentation>
763	<resprocessing>
764	<outcomes>
765	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
766	maxvalue = "1" defaultval = "0"/>
767	<decvar varname = "CORRECT" vartype = "Boolean"
768	defaultval = "False"/>
769	</outcomes>
770	<respcondition continue = "No">

771	<qticomment>Correct response check</qticomment>
772	<conditionvar>
773	<varequal respident = "LID03" case = "No">B</varequal>
774	</conditionvar>
775	<setvar varname = "SCORE" action = "Set">1</setvar>
776	<setvar varname = "CORRECT" action = "Set">True</setvar>
777	<displayfeedback linkrefid = "Correct"
778	feedbacktype = "Response"/>
779	</respcondition>
780	<respcondition continue = "No">
781	<conditionvar>
782	<not>
783	<varequal respident = "LID03" case = "No">B
784	</varequal>
785	</not>
786	</conditionvar>
787	<displayfeedback linkrefid = "Incorrect"
788	feedbacktype = "Response"/>
789	</respcondition>
790	</resprocessing>
791	<itemfeedback ident = "Correct" view = "All">
792	<material>
793	<mattext>Correct.</mattext>
794	</material>
795	</itemfeedback>
796	<itemfeedback ident = "Incorrect" view = "All">
797	<material>
798	<mattext>No. Only Sections support hierachical Assessments.
799	</mattext>
800	</material>
801	</itemfeedback>
802	</item>
803	<item ident = "IMS_QTIVlp2_I_SAO_05" maxattempts = "2">
804	<itemmetadata>
805	<qtimetadadata>
806	<qtimetadadatafield>
807	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
808	<fieldentry>basic</fieldentry>
809	</qtimetadadatafield>
810	<qtimetadadatafield>
811	<fieldlabel>qmd_topic</fieldlabel>
812	<fieldentry>qtivlp2test</fieldentry>
813	</qtimetadadatafield>
814	</qtimetadadata>
815	</itemmetadata>
816	<presentation>
817	<flow class = "Block">
818	<material>
819	<mattext>Which versions of the QTI specifications support
820	results reporting ?
821	</mattext>
822	</material>
823	<response_lid ident = "LID04" rcardinality = "Multiple"
824	rtiming = "No">
825	<render_choice shuffle="No" minnumber="1" maxnumber="4">
826	<flow_label class = "Block">
827	<response_label ident = "A">
828	<material>
829	<mattext>V1.0</mattext>
830	</material>



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831         </response_label>
832     </flow_label>
833     <flow_label class = "Block">
834         <response_label ident = "B">
835             <material>
836                 <mattext>V1.01</mattext>
837             </material>
838         </response_label>
839     </flow_label>
840     <flow_label class = "Block">
841         <response_label ident = "C">
842             <material>
843                 <mattext>V1.1</mattext>
844             </material>
845         </response_label>
846     </flow_label>
847     <flow_label class = "Block">
848         <response_label ident = "D">
849             <material>
850                 <mattext>V1.2</mattext>
851             </material>
852         </response_label>
853     </flow_label>
854 </render_choice>
855 </response_lid>
856 </flow>
857 </presentation>
858 <resprocessing>
859     <outcomes>
860         <decvar varname = "SCORE" defaultval = "0" minvalue = "0"
861             maxvalue = "1" vartype = "Integer"/>
862     </outcomes>
863     <respcondition continue = "No">
864         <qticomment>Correct response processing</qticomment>
865         <conditionvar>
866             <not>
867                 <varequal respident = "LID04" case = "No">A
868             </varequal>
869             </not>
870             <not>
871                 <varequal respident = "LID04" case = "No">B
872             </varequal>
873             </not>
874             <not>
875                 <varequal respident = "LID04" case = "No">C
876             </varequal>
877             </not>
878             <varequal respident = "LID04" case = "No">D</varequal>
879         </conditionvar>
880         <setvar varname = "SCORE" action = "Set">1</setvar>
881         <setvar varname = "CORRECT" action = "Set">True</setvar>
882         <displayfeedback linkrefid = "Correct"
883             feedbacktype = "Response"/>
884     </respcondition>
885     <respcondition continue = "Yes">
886         <qticomment>Incorrect response processing</qticomment>
887         <conditionvar>
888             <not>
889                 <and>
890                     <not>

```

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891         <varequal respident = "LID04" case = "No">A
892         </varequal>
893     </not>
894 <not>
895     <varequal respident = "LID04" case = "No">B
896     </varequal>
897 </not>
898 <not>
899     <varequal respident = "LID04" case = "No">C
900     </varequal>
901 </not>
902 <varequal respident = "LID04" case = "No">D
903 </varequal>
904 </and>
905 </not>
906 </conditionvar>
907 <displayfeedback linkrefid = "Incorrect"
908     feedbacktype = "Response"/>
909 </respcondition>
910 </resprocessing>
911 <itemfeedback ident = "Correct" view = "All">
912     <material>
913         <mattext>Yes. Only V1.2 supports results reporting.
914     </mattext>
915     </material>
916 </itemfeedback>
917 <itemfeedback ident = "Incorrect" view = "All">
918     <material>
919         <mattext>No. Only V1.2 supports results reporting.</mattext>
920     </material>
921 </itemfeedback>
922 </item>
923 <item ident = "IMS_QTIVlp2_I_SAO_06" maxattempts = "2">
924     <itemmetadata>
925         <qtimetadadata>
926             <qtimetadadatafield>
927                 <fieldlabel>qmd_levelofdifficulty</fieldlabel>
928                 <fieldentry>basic</fieldentry>
929             </qtimetadadatafield>
930             <qtimetadadatafield>
931                 <fieldlabel>qmd_topic</fieldlabel>
932                 <fieldentry>qtivlp2test</fieldentry>
933             </qtimetadadatafield>
934         </qtimetadadata>
935     </itemmetadata>
936     <presentation>
937         <flow class = "Block">
938             <material>
939                 <mattext>Which question types are supported by the full
940                 QTI specification ?
941             </mattext>
942             </material>
943             <response_lid ident = "LID03" rcardinality = "Multiple"
944                 rtiming = "No">
945                 <render_choice shuffle="Yes" minnumber="1" maxnumber="1">
946                     <flow_label class = "Block">
947                         <response_label ident = "A">
948                             <material>
949                                 <mattext>True/False</mattext>
950                             </material>

```

951	</response_label>
952	</flow_label>
953	<flow_label class = "Block">
954	<response_label ident = "B">
955	<material>
956	<mattext>Multiple choice with images
957	</mattext>
958	</material>
959	</response_label>
960	</flow_label>
961	<flow_label class = "Block">
962	<response_label ident = "C">
963	<material>
964	<mattext>Multiple response</mattext>
965	</material>
966	</response_label>
967	</flow_label>
968	<flow_label class = "Block">
969	<response_label ident = "D">
970	<material>
971	<mattext>Fill-in-the-blank (integers)
972	</mattext>
973	</material>
974	</response_label>
975	</flow_label>
976	<flow_label class = "Block">
977	<response_label ident = "D">
978	<material>
979	<mattext>Fill-in-the-blank (essay)
980	</mattext>
981	</material>
982	</response_label>
983	</flow_label>
984	<flow_label class = "Block">
985	<response_label ident = "D">
986	<material>
987	<mattext>Image hot spot (multiple)
988	</mattext>
989	</material>
990	</response_label>
991	</flow_label>
992	</render_choice>
993	</response_lid>
994	</flow>
995	</presentation>
996	<resprocessing>
997	<outcomes>
998	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
999	maxvalue = "1" defaultval = "0"/>
1000	<decvar varname = "CORRECT" vartype = "Boolean"
1001	defaultval = "False"/>
1002	</outcomes>
1003	<respcondition continue = "No">
1004	<qticomment>Correct response processing</qticomment>
1005	<conditionvar>
1006	<varequal respident = "LID03" case = "No">A</varequal>
1007	<varequal respident = "LID03" case = "No">B</varequal>
1008	<varequal respident = "LID03" case = "No">C</varequal>
1009	<varequal respident = "LID03" case = "No">D</varequal>
1010	<varequal respident = "LID03" case = "No">E</varequal>

1011	<varequal respident = "LID03" case = "No">F</varequal>
1012	</conditionvar>
1013	<setvar varname = "SCORE" action = "Set">1</setvar>
1014	<displayfeedback linkrefid = "Correct"
1015	feedbacktype = "Response"/>
1016	</respcondition>
1017	<respcondition continue = "No">
1018	<qticomment>Incorrect answer response processing</qticomment>
1019	<conditionvar>
1020	<not>
1021	<and>
1022	<varequal respident = "LID03" case = "No">A
1023	</varequal>
1024	<varequal respident = "LID03" case = "No">B
1025	</varequal>
1026	<varequal respident = "LID03" case = "No">C
1027	</varequal>
1028	<varequal respident = "LID03" case = "No">D
1029	</varequal>
1030	<varequal respident = "LID03" case = "No">E
1031	</varequal>
1032	<varequal respident = "LID03" case = "No">F
1033	</varequal>
1034	</and>
1035	</not>
1036	</conditionvar>
1037	<displayfeedback linkrefid = "Incorrect"
1038	feedbacktype = "Response"/>
1039	</respcondition>
1040	</resprocessing>
1041	<itemfeedback ident = "Correct" view = "All">
1042	<material>
1043	<mattext>Correct. All of those question types are supported.
1044	</mattext>
1045	</material>
1046	</itemfeedback>
1047	<itemfeedback ident = "Incorrect" view = "All">
1048	<material>
1049	<mattext>No. All of those question types are supported.
1050	</mattext>
1051	</material>
1052	</itemfeedback>
1053	</item>
1054	<item ident = "IMS_QTIVlp2_I_SAO_07" maxattempts = "2">
1055	<itemmetadata>
1056	<qtimetadadata>
1057	<qtimetadadatafield>
1058	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
1059	<fieldentry>basic</fieldentry>
1060	</qtimetadadatafield>
1061	<qtimetadadatafield>
1062	<fieldlabel>qmd_topic</fieldlabel>
1063	<fieldentry>qtivlp2test</fieldentry>
1064	</qtimetadadatafield>
1065	</qtimetadadata>
1066	</itemmetadata>
1067	<presentation>
1068	<flow class = "Block">
1069	<material>
1070	<mattext>Which question types are supported by the

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1071         QTI Lite specification ?
1072     </mattext>
1073 </material>
1074 <response_lid ident = "LID03" rcardinality = "Multiple"
1075     rtiming = "No">
1076     <render_choice shuffle="Yes" minnumber="1" maxnumber="4">
1077         <flow_label class = "Block">
1078             <response_label ident = "A">
1079                 <material>
1080                     <mattext>True/False</mattext>
1081                 </material>
1082             </response_label>
1083         </flow_label>
1084         <flow_label class = "Block">
1085             <response_label ident = "B">
1086                 <material>
1087                     <mattext>Multiple choice</mattext>
1088                 </material>
1089             </response_label>
1090         </flow_label>
1091         <flow_label class = "Block">
1092             <response_label ident = "C">
1093                 <material>
1094                     <mattext>Multiple response</mattext>
1095                 </material>
1096             </response_label>
1097         </flow_label>
1098         <flow_label class = "Block">
1099             <response_label ident = "D">
1100                 <material>
1101                     <mattext>Fill-in-the-blank</mattext>
1102                 </material>
1103             </response_label>
1104         </flow_label>
1105     </render_choice>
1106 </response_lid>
1107 </flow>
1108 </presentation>
1109 <resprocessing>
1110     <outcomes>
1111         <decvar varname = "SCORE" vartype = "Integer"
1112             defaultval = "0" minvalue = "0" maxvalue = "1"/>
1113         <decvar varname = "CORRECT" vartype = "Boolean"
1114             defaultval = "False"/>
1115     </outcomes>
1116     <respcondition continue = "No">
1117         <qticomment>Correct answer response processing.</qticomment>
1118         <conditionvar>
1119             <varequal respident = "LID03" case = "No">A</varequal>
1120             <varequal respident = "LID03" case = "No">B</varequal>
1121             <not>
1122                 <varequal respident = "LID03" case = "No">C
1123             </varequal>
1124             </not>
1125             <not>
1126                 <varequal respident = "LID03" case = "No">D
1127             </varequal>
1128             </not>
1129         </conditionvar>
1130     <setvar varname = "SCORE" action = "Set">1</setvar>

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1131         <setvar varname = "CORRECT" action = "Set">True</setvar>
1132         <displayfeedback linkrefid = "Correct"
1133             feedbacktype = "Response"/>
1134     </respcondition>
1135     <respcondition continue = "No">
1136         <qticomment>Incorrect answer response processing.
1137     </qticomment>
1138     <conditionvar>
1139         <not>
1140             <and>
1141                 <varequal respident = "LID03" case = "No">A
1142             </varequal>
1143                 <varequal respident = "LID03" case = "No">B
1144             </varequal>
1145             <not>
1146                 <varequal respident = "LID03" case = "No">C
1147             </varequal>
1148             </not>
1149             <not>
1150                 <varequal respident = "LID03" case = "No">D
1151             </varequal>
1152             </not>
1153             </and>
1154         </not>
1155     </conditionvar>
1156     <displayfeedback linkrefid = "Incorrect"
1157         feedbacktype = "Response"/>
1158 </respcondition>
1159 </resprocessing>
1160 <itemfeedback ident = "Correct" view = "All">
1161     <material>
1162         <mattext>Correct. True/False and Multiple-choice only.
1163     </mattext>
1164     </material>
1165 </itemfeedback>
1166 <itemfeedback ident = "Incorrect" view = "All">
1167     <material>
1168         <mattext>No. Only True/False and Multiple-choice are
1169         supported.
1170     </mattext>
1171     </material>
1172 </itemfeedback>
1173 </item>
1174 </section>
1175 </section>
1176 <section ident = "IMS_QTIVlp2_S_SAO_12">
1177     <outcomes_processing scoremodel = "SumofScores">
1178         <outcomes>
1179             <decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
1180                 minvalue = "0" maxvalue = "8" cutvalue = "6"/>
1181         </outcomes>
1182     </outcomes_processing>
1183     <outcomes_processing scoremodel = "NumberCorrect">
1184         <outcomes>
1185             <decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
1186                 minvalue = "0" maxvalue = "8" cutvalue = "6"/>
1187         </outcomes>
1188     </outcomes_processing>
1189     <selection_ordering>
1190     </selection/>

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1191         <order order_type = "Random"/>
1192     </selection_ordering>
1193     <section title = "IMSQTI_Selection&OrderingTest_S12p1"
1194         ident = "IMS_QTIVlp2_S_SAO_12p1">
1195         <qticomment>Set of True/false questions</qticomment>
1196         <outcomes_processing scoremodel = "SumofScores">
1197             <outcomes>
1198                 <decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
1199                     minvalue = "0" maxvalue = "4" cutvalue = "3"/>
1200             </outcomes>
1201         </outcomes_processing>
1202         <outcomes_processing scoremodel = "NumberCorrect">
1203             <outcomes>
1204                 <decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
1205                     minvalue = "0" maxvalue = "4" cutvalue = "3"/>
1206             </outcomes>
1207         </outcomes_processing>
1208     </selection_ordering>
1209     <selection/>
1210     <order order_type = "Random"/>
1211 </selection_ordering>
1212 <item ident = "IMS_QTIVlp2_I_SAO_02" maxattempts = "2">
1213     <itemmetadata>
1214         <qtimetadadata>
1215             <qtimetadadatafield>
1216                 <fieldlabel>qmd_levelofdifficulty</fieldlabel>
1217                 <fieldentry>basic</fieldentry>
1218             </qtimetadadatafield>
1219             <qtimetadadatafield>
1220                 <fieldlabel>qmd_topic</fieldlabel>
1221                 <fieldentry>qtivlp2test</fieldentry>
1222             </qtimetadadatafield>
1223         </qtimetadadata>
1224     </itemmetadata>
1225     <presentation>
1226         <flow class = "Block">
1227             <material>
1228                 <mattext>The QTI specification supports the exchange of
1229                     which data structures ?
1230                 </mattext>
1231             </material>
1232             <response_lid ident = "LID02" rcardinality = "Multiple"
1233                 rtiming = "No">
1234                 <render_choice shuffle="Yes" minnumber="1" maxnumber="2">
1235                     <flow_label class = "Block">
1236                         <response_label ident = "A">
1237                             <material>
1238                                 <mattext>Response</mattext>
1239                             </material>
1240                         </response_label>
1241                     </flow_label>
1242                     <flow_label class = "Block">
1243                         <response_label ident = "B">
1244                             <material>
1245                                 <mattext>Question</mattext>
1246                             </material>
1247                         </response_label>
1248                     </flow_label>
1249                     <flow_label class = "Block">
1250                         <response_label ident = "C">

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1251         <material>
1252             <mattext>Item</mattext>
1253         </material>
1254     </response_label>
1255 </flow_label>
1256 <flow_label class = "Block">
1257     <response_label ident = "D">
1258         <material>
1259             <mattext>Assessment</mattext>
1260         </material>
1261     </response_label>
1262 </flow_label>
1263 </render_choice>
1264 </response_lid>
1265 </flow>
1266 </presentation>
1267 <resprocessing>
1268     <outcomes>
1269         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1270             maxvalue = "1" defaultval = "0"/>
1271         <decvar varname = "CORRECT" vartype = "Boolean"
1272             defaultval = "False"/>
1273     </outcomes>
1274     <respcondition continue = "No">
1275         <qticomment>Correct response detection</qticomment>
1276         <conditionvar>
1277             <varequal respident = "LID02" case = "No">A</varequal>
1278             <varequal respident = "LID02" case = "No">B</varequal>
1279             <not>
1280                 <varequal respident = "LID02" case = "No">C
1281             </varequal>
1282             </not>
1283             <not>
1284                 <varequal respident = "LID02" case = "No">D
1285             </varequal>
1286             </not>
1287         </conditionvar>
1288         <setvar varname = "SCORE" action = "Set">1</setvar>
1289         <setvar varname = "CORRECT" action = "Set">True</setvar>
1290         <displayfeedback linkrefid = "Correct"
1291             feedbacktype = "Response"/>
1292     </respcondition>
1293     <respcondition continue = "No">
1294         <conditionvar>
1295             <not>
1296                 <and>
1297                     <varequal respident = "LID02" case = "No">A
1298                 </varequal>
1299                     <varequal respident = "LID02" case = "No">B
1300                 </varequal>
1301                 <not>
1302                     <varequal respident = "LID02" case = "No">C
1303                 </varequal>
1304                 </not>
1305                 <not>
1306                     <varequal respident = "LID02" case = "No">D
1307                 </varequal>
1308                 </not>
1309             </and>
1310             </not>

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1311         </conditionvar>
1312         <displayfeedback linkrefid = "Incorrect"
1313             feedbacktype = "Response"/>
1314     </respcondition>
1315 </resprocessing>
1316 <itemfeedback ident = "Correct" view = "All">
1317     <material>
1318         <mattext>Correct. Items and Assessment.</mattext>
1319     </material>
1320 </itemfeedback>
1321 <itemfeedback ident = "Incorrect" view = "All">
1322     <material>
1323         <mattext>No. The correct answers are Item and Assessment.
1324     </mattext>
1325     </material>
1326 </itemfeedback>
1327 </item>
1328 <item ident = "IMS_QTIVlp2_I_SAO_08" maxattempts = "2">
1329     <itemmetadata>
1330         <qtimetadadata>
1331             <qtimetadadatafield>
1332                 <fieldlabel>qmd_levelofdifficulty</fieldlabel>
1333                 <fieldentry>basic</fieldentry>
1334             </qtimetadadatafield>
1335             <qtimetadadatafield>
1336                 <fieldlabel>qmd_topic</fieldlabel>
1337                 <fieldentry>qtivlp2test</fieldentry>
1338             </qtimetadadatafield>
1339         </qtimetadadata>
1340     </itemmetadata>
1341     <presentation>
1342         <flow class = "Block">
1343             <material>
1344                 <mattext>Time-based responses are supported by the QTI
1345                 specification.
1346             </mattext>
1347             </material>
1348             <response_lid ident = "TF02" rcardinality = "Single"
1349                 rtiming = "No">
1350                 <render_choice shuffle = "Yes">
1351                     <flow_label class = "Block">
1352                         <response_label ident = "T">
1353                             <material>
1354                                 <mattext>True</mattext>
1355                             </material>
1356                         </response_label>
1357                     </flow_label>
1358                     <flow_label class = "Block">
1359                         <response_label ident = "F">
1360                             <material>
1361                                 <mattext>False</mattext>
1362                             </material>
1363                         </response_label>
1364                     </flow_label>
1365                 </render_choice>
1366             </response_lid>
1367         </flow>
1368     </presentation>
1369 </resprocessing>
1370     <qticomment>Processing for the correct answer.</qticomment>

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1371	<outcomes>
1372	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1373	maxvalue = "1" defaultval = "0"/>
1374	<decvar varname = "CORRECT" vartype = "Boolean"
1375	defaultval = "False"/>
1376	</outcomes>
1377	<respcondition continue = "No">
1378	<conditionvar>
1379	<varequal respident = "TF02" case = "No">T</varequal>
1380	</conditionvar>
1381	<setvar varname = "SCORE" action = "Set">1</setvar>
1382	<setvar varname = "CORRECT" action = "Set">True</setvar>
1383	<displayfeedback feedbacktype = "Response"
1384	linkrefid = "Correct"/>
1385	</respcondition>
1386	<respcondition continue = "No">
1387	<conditionvar>
1388	<varequal respident = "TF02" case = "No">F</varequal>
1389	</conditionvar>
1390	<displayfeedback linkrefid = "Incorrect"
1391	feedbacktype = "Response"/>
1392	</respcondition>
1393	</resprocessing>
1394	<itemfeedback ident = "Correct" view = "All">
1395	<material>
1396	<mattext>Correct answer.</mattext>
1397	</material>
1398	</itemfeedback>
1399	<itemfeedback ident = "Incorrect" view = "All">
1400	<material>
1401	<mattext>Sorry, you are wrong. Time-based reponses ARE
1402	supported by the specification.
1403	</mattext>
1404	</material>
1405	</itemfeedback>
1406	</item>
1407	<item ident = "IMS_QTIVlp2_I_SAO_09" maxattempts = "2">
1408	<itemmetadata>
1409	<qtimetadadata>
1410	<qtimetadadatafield>
1411	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
1412	<fieldentry>advanced</fieldentry>
1413	</qtimetadadatafield>
1414	<qtimetadadatafield>
1415	<fieldlabel>qmd_topic</fieldlabel>
1416	<fieldentry>qtivlp2test</fieldentry>
1417	</qtimetadadatafield>
1418	</qtimetadadata>
1419	</itemmetadata>
1420	<presentation>
1421	<flow class = "Block">
1422	<material>
1423	<mattext>Items defined according to QTI V1.0 are not
1424	compatible with Items from QTI V1.2.
1425	</mattext>
1426	</material>
1427	<response_lid ident = "TF03" rcardinality = "Single"
1428	rtiming = "No">
1429	<render_choice shuffle = "Yes">
1430	<flow_label class = "Block">

1431	<response_label ident = "T">
1432	<material>
1433	<mattext>True</mattext>
1434	</material>
1435	</response_label>
1436	</flow_label>
1437	<flow_label class = "Block">
1438	<response_label ident = "F">
1439	<material>
1440	<mattext>False</mattext>
1441	</material>
1442	</response_label>
1443	</flow_label>
1444	</render_choice>
1445	</response_lid>
1446	</flow>
1447	</presentation>
1448	<resprocessing>
1449	<qticomment>Processing for the correct answer.</qticomment>
1450	<outcomes>
1451	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1452	maxvalue = "1" defaultval = "0"/>
1453	<decvar varname = "CORRECT" vartype = "Boolean"
1454	defaultval = "False"/>
1455	</outcomes>
1456	<respcondition continue = "No">
1457	<conditionvar>
1458	<varequal respident = "TF03" case = "No">F</varequal>
1459	</conditionvar>
1460	<setvar varname = "SCORE" action = "Set">1</setvar>
1461	<setvar varname = "CORRECT" action = "Set">True</setvar>
1462	<displayfeedback feedbacktype = "Response"
1463	linkrefid = "Correct"/>
1464	</respcondition>
1465	<respcondition continue = "No">
1466	<conditionvar>
1467	<varequal respident = "TF03" case = "No">T</varequal>
1468	</conditionvar>
1469	<displayfeedback linkrefid = "Incorrect"
1470	feedbacktype = "Response"/>
1471	</respcondition>
1472	</resprocessing>
1473	<itemfeedback ident = "Correct" view = "All">
1474	<material>
1475	<mattext>Correct answer.</mattext>
1476	</material>
1477	</itemfeedback>
1478	<itemfeedback ident = "Incorrect" view = "All">
1479	<material>
1480	<mattext xml:lang = "en-US" xml:space = "default" texttype =
1481	"text/plain" charset = "ascii-us">Sorry, you are wrong. V1.0 Items ARE compatible with
1482	the V1.2 specification.</mattext>
1483	</material>
1484	</itemfeedback>
1485	</item>
1486	<item ident = "IMS_QTIVlp2_I_SAO_10" maxattempts = "2">
1487	<itemmetadata>
1488	<qtimetadata>
1489	<qtimedatafield>
1490	<fieldlabel>qmd_levelofdifficulty</fieldlabel>

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1491         <fieldentry>advanced</fieldentry>
1492     </qtimetadadatafield>
1493     <qtimetadadatafield>
1494         <fieldlabel>qmd_topic</fieldlabel>
1495         <fieldentry>qativlp2test</fieldentry>
1496     </qtimetadadatafield>
1497 </qtimetadadata>
1498 </itemmetadadata>
1499 <presentation>
1500     <flow class = "Block">
1501         <material>
1502             <mattext>The QTI specification is used within the ADL
1503                 SCORM.
1504             </mattext>
1505         </material>
1506         <response_lid ident="TF04" rcardinality="Single"
1507             rtiming="No">
1508             <render_choice shuffle = "Yes">
1509                 <flow_label class = "Block">
1510                     <response_label ident = "T">
1511                         <material>
1512                             <mattext>True</mattext>
1513                         </material>
1514                     </response_label>
1515                 </flow_label>
1516                 <flow_label class = "Block">
1517                     <response_label ident = "F">
1518                         <material>
1519                             <mattext>False</mattext>
1520                         </material>
1521                     </response_label>
1522                 </flow_label>
1523             </render_choice>
1524         </response_lid>
1525     </flow>
1526 </presentation>
1527 <resprocessing>
1528     <qticomment>Processing for the correct answer.</qticomment>
1529     <outcomes>
1530         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1531             maxvalue = "1" defaultval = "0"/>
1532         <decvar varname = "CORRECT" vartype = "Boolean"
1533             defaultval = "False"/>
1534     </outcomes>
1535     <respcondition continue = "No">
1536         <conditionvar>
1537             <varequal respident = "TF04" case = "No">T</varequal>
1538         </conditionvar>
1539         <setvar varname = "SCORE" action = "Set">1</setvar>
1540         <setvar varname = "CORRECT" action = "Set">True</setvar>
1541         <displayfeedback feedbacktype = "Response"
1542             linkrefid = "Correct"/>
1543     </respcondition>
1544     <respcondition continue = "No">
1545         <conditionvar>
1546             <varequal respident = "TF04" case = "No">F</varequal>
1547         </conditionvar>
1548         <displayfeedback linkrefid = "Incorrect"
1549             feedbacktype = "Response"/>
1550     </respcondition>

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1551         </resprocessing>
1552         <itemfeedback ident = "Correct" view = "All">
1553             <material>
1554                 <mattext>Correct answer.</mattext>
1555             </material>
1556         </itemfeedback>
1557         <itemfeedback ident = "Incorrect" view = "All">
1558             <material>
1559                 <mattext>Sorry, you are wrong. The QTI specification is NOT
1560                     used within ADL SCORM.
1561             </mattext>
1562             </material>
1563         </itemfeedback>
1564     </item>
1565 </section>
1566 <section title = "IMSQTI_Selection&OrderingTest_S12p2"
1567     ident = "IMS_QTIVlp2_S_SAO_12p2">
1568     <qticomment>Set of multiple-choice/multiple-response questions
1569     </qticomment>
1570     <outcomes_processing scoremodel = "SumofScores">
1571         <outcomes>
1572             <decvar vartype = "Integer" varname = "SCORE" defaultval = "0"
1573                 minvalue = "0" maxvalue = "4" cutvalue = "3"/>
1574         </outcomes>
1575     </outcomes_processing>
1576     <outcomes_processing scoremodel = "NumberCorrect">
1577         <outcomes>
1578             <decvar varname = "CORRECT" vartype = "Integer" defaultval = "0"
1579                 minvalue = "0" maxvalue = "4" cutvalue = "3"/>
1580         </outcomes>
1581     </outcomes_processing>
1582     <selection_ordering>
1583         <sequence_parameter pname = "maxscorepossible">6
1584         </sequence_parameter>
1585     </selection_ordering>
1586     <order order_type = "Random"/>
1587 </section_ordering>
1588 <item ident = "IMS_QTIVlp2_I_SAO_01" maxattempts = "2">
1589     <itemmetadata>
1590         <qtimetadadata>
1591             <qtimetadadatafield>
1592                 <fieldlabel>qmd_levelofdifficulty</fieldlabel>
1593                 <fieldentry>advanced</fieldentry>
1594             </qtimetadadatafield>
1595             <qtimetadadatafield>
1596                 <fieldlabel>qmd_topic</fieldlabel>
1597                 <fieldentry>qtivlp2test</fieldentry>
1598             </qtimetadadatafield>
1599         </qtimetadadata>
1600     </itemmetadata>
1601     <presentation>
1602         <flow>
1603             <material>
1604                 <mattext>Which of the following statements are true about
1605                     the QTI specification ?
1606             </mattext>
1607             </material>
1608             <response_lid ident = "LID01" rcardinality = "Multiple"
1609                 rtiming = "No">
1610                 <render_choice shuffle = "Yes" minnumber = "1"

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1611         maxnumber = "5">
1612         <flow_label>
1613             <response_label ident = "A">
1614                 <material>
1615                     <mattext>It is independent of pedagogy
1616                 </mattext>
1617             </material>
1618         </response_label>
1619     </flow_label>
1620     <flow_label>
1621         <response_label ident = "B">
1622             <material>
1623                 <mattext>It cannot be extended to support
1624                     proprietary features
1625                 </mattext>
1626             </material>
1627         </response_label>
1628     </flow_label>
1629     <flow_label>
1630         <response_label ident = "C">
1631             <material>
1632                 <mattext>It contains many unnecessary
1633                     features
1634                 </mattext>
1635             </material>
1636         </response_label>
1637     </flow_label>
1638     <flow_label>
1639         <response_label ident = "D">
1640             <material>
1641                 <mattext>It provides different content
1642                     views for different types of
1643                     participants
1644                 </mattext>
1645             </material>
1646         </response_label>
1647     </flow_label>
1648     <flow_label>
1649         <response_label ident = "E">
1650             <material>
1651                 <mattext>It is based on a well established
1652                     framework
1653                 </mattext>
1654             </material>
1655         </response_label>
1656     </flow_label>
1657 </render_choice>
1658 </response_lid>
1659 </flow>
1660 </presentation>
1661 <resprocessing>
1662     <qticomment/>
1663     <outcomes>
1664         <decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1665             maxvalue = "2" defaultval = "0"/>
1666         <decvar varname = "CORRECT" vartype = "Boolean"
1667             defaultval = "False"/>
1668     </outcomes>
1669     <respcondition continue = "No">
1670         <qticomment>To detect if the correct answer has been

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1671	supplied.
1672	</qticomment>
1673	<conditionvar>
1674	<varequal respident = "LID01">A</varequal>
1675	<not>
1676	<varequal respident = "LID01" case = "No">B
1677	</varequal>
1678	</not>
1679	<not>
1680	<varequal respident = "LID01" case = "No">C
1681	</varequal>
1682	</not>
1683	<varequal respident = "LID01">D</varequal>
1684	<varequal respident = "LID01">E</varequal>
1685	</conditionvar>
1686	<setvar varname = "SCORE" action = "Set">2</setvar>
1687	<setvar varname = "CORRECT" action = "Set">True</setvar>
1688	<displayfeedback feedbacktype = "Response"
1689	linkrefid = "Correct"/>
1690	</respcondition>
1691	<respcondition continue = "No">
1692	<qticomment>To detect if the incorrect answer is supplied.
1693	</qticomment>
1694	<conditionvar>
1695	<not>
1696	<and>
1697	<varequal respident = "LID01" case = "No">A
1698	</varequal>
1699	<not>
1700	<varequal respident = "LID01" case = "No">B
1701	</varequal>
1702	</not>
1703	<not>
1704	<varequal respident = "LID01" case = "No">C
1705	</varequal>
1706	</not>
1707	<varequal respident = "LID01">D</varequal>
1708	<varequal respident = "LID01">E</varequal>
1709	</and>
1710	</not>
1711	</conditionvar>
1712	<displayfeedback feedbacktype = "Response"
1713	linkrefid = "InCorrect"/>
1714	</respcondition>
1715	</resprocessing>
1716	<itemfeedback ident = "Correct">
1717	<material>
1718	<mattext>Correct answer is A, D, E.</mattext>
1719	</material>
1720	</itemfeedback>
1721	<itemfeedback ident = "Incorrect" view = "All">
1722	<material>
1723	<mattext>Answers B and C are incorrect.</mattext>
1724	</material>
1725	</itemfeedback>
1726	</item>
1727	<item ident = "IMS_QTIVlp2_I_SAO_03" maxattempts = "2">
1728	<itemmetadata>
1729	<qtimetadata>
1730	<qtimedatafield>

1731	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
1732	<fieldentry>basic</fieldentry>
1733	</qtimetadafield>
1734	<qtimetadafield>
1735	<fieldlabel>qmd_topic</fieldlabel>
1736	<fieldentry>qativlp2test</fieldentry>
1737	</qtimetadafield>
1738	</qtimetadata>
1739	</itemmetadata>
1740	<presentation>
1741	<flow>
1742	<material>
1743	<mattext>Multiple Assessments cannot be contained in a
1744	single QTI ASI XML instance.
1745	</mattext>
1746	</material>
1747	<response_lid ident = "TF01" rcardinality = "Single"
1748	rtiming = "No">
1749	<render_choice shuffle = "Yes">
1750	<flow_label>
1751	<response_label ident = "T">
1752	<material>
1753	<mattext>True</mattext>
1754	</material>
1755	</response_label>
1756	</flow_label>
1757	<flow_label>
1758	<response_label ident = "F">
1759	<material>
1760	<mattext>False</mattext>
1761	</material>
1762	</response_label>
1763	</flow_label>
1764	</render_choice>
1765	</response_lid>
1766	</flow>
1767	</presentation>
1768	<resprocessing>
1769	<qticomment>Processing for the incorrect answer.</qticomment>
1770	<outcomes>
1771	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1772	maxvalue = "2" defaultval = "0"/>
1773	<decvar varname = "CORRECT" vartype = "Boolean"
1774	defaultval = "False"/>
1775	</outcomes>
1776	<respcondition continue = "No">
1777	<conditionvar>
1778	<varequal respident = "TF01">T</varequal>
1779	</conditionvar>
1780	<displayfeedback feedbacktype = "Response"
1781	linkrefid = "Incorrect"/>
1782	</respcondition>
1783	<respcondition continue = "No">
1784	<conditionvar>
1785	<varequal respident = "TF01" case = "No">F</varequal>
1786	</conditionvar>
1787	<setvar varname = "SCORE" action = "Set">2</setvar>
1788	<setvar varname = "CORRECT" action = "Set">True</setvar>
1789	<displayfeedback linkrefid = "Correct"
1790	feedbacktype = "Response"/>



1791	</responcondition>
1792	</resprocessing>
1793	<itemfeedback ident = "Correct">
1794	<material>
1795	<mattext>Correct answer.</mattext>
1796	</material>
1797	</itemfeedback>
1798	<itemfeedback ident = "Incorrect">
1799	<material>
1800	<mattext>Sorry, you are wrong. A QTI-XML instance CAN
1801	contain multiple Assessments.
1802	</mattext>
1803	</material>
1804	</itemfeedback>
1805	</item>
1806	<item ident = "IMS_QTIVlp2_I_SAO_04" maxattempts = "2">
1807	<itemmetadata>
1808	<qtimetadata>
1809	<qtimetadatafield>
1810	<fieldlabel>qmd_levelofdifficulty</fieldlabel>
1811	<fieldentry>advanced</fieldentry>
1812	</qtimetadatafield>
1813	<qtimetadatafield>
1814	<fieldlabel>qmd_topic</fieldlabel>
1815	<fieldentry>qtivlp2test</fieldentry>
1816	</qtimetadatafield>
1817	</qtimetadata>
1818	</itemmetadata>
1819	<presentation>
1820	<flow>
1821	<material>
1822	<mattext>Which one of the following data structures is
1823	used to provide hierarchically structured
1824	assessments?
1825	</mattext>
1826	</material>
1827	<response_lid ident = "LID03" rcardinality = "Single"
1828	rtiming = "No">
1829	<render_choice shuffle = "Yes">
1830	<flow_label>
1831	<response_label ident = "A">
1832	<material>
1833	<mattext>Assessment</mattext>
1834	</material>
1835	</response_label>
1836	</flow_label>
1837	<flow_label>
1838	<response_label ident = "B">
1839	<material>
1840	<mattext>Section</mattext>
1841	</material>
1842	</response_label>
1843	</flow_label>
1844	<flow_label>
1845	<response_label ident = "C">
1846	<material>
1847	<mattext>Item</mattext>
1848	</material>
1849	</response_label>
1850	</flow_label>

1850	<flow_label>
1851	<response_label ident = "D">
1852	<material>
1853	<mattext>Question</mattext>
1854	</material>
1855	</response_label>
1856	</flow_label>
1857	</render_choice>
1858	</response_lid>
1859	</flow>
1860	</presentation>
1861	<resprocessing>
1862	<outcomes>
1863	<decvar varname = "SCORE" vartype = "Integer" minvalue = "0"
1864	maxvalue = "2" defaultval = "0"/>
1865	<decvar varname = "CORRECT" vartype = "Boolean"
1866	defaultval = "False"/>
1867	</outcomes>
1868	<respcondition continue = "No">
1869	<qticomment>Correct response check</qticomment>
1870	<conditionvar>
1871	<varequal respident = "LID03" case = "No">B</varequal>
1872	</conditionvar>
1873	<setvar varname = "SCORE" action = "Set">2</setvar>
1874	<setvar varname = "CORRECT" action = "Set">True</setvar>
1875	<displayfeedback linkrefid = "Correct"
1876	feedbacktype = "Response"/>
1877	</respcondition>
1878	<respcondition>
1879	<conditionvar>
1880	<not>
1881	<varequal respident = "LID03" case = "No">B
1882	</varequal>
1883	</not>
1884	</conditionvar>
1885	<setvar varname = "SCORE" action = "Set">0</setvar>
1886	<displayfeedback linkrefid = "Incorrect"
1887	feedbacktype = "Response"/>
1888	</respcondition>
1889	</resprocessing>
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1891	<material>
1892	<mattext>Correct.</mattext>
1893	</material>
1894	</itemfeedback>
1895	<itemfeedback ident = "Incorrect" view = "All">
1896	<material>
1897	<mattext>No. Only Sections support hierachical Assessments.
1898	</mattext>
1899	</material>
1900	</itemfeedback>
1901	</item>
1902	</section>
1903	</section>
1904	</assessment>
1905	</questestinterop>

The Result report of this Assessment assumes that:

- Only one attempt was required for each Item;

- Only the Section labelled '11' was presented.

1	<qti_result_report>
2	<result>
3	<context>
4	<name>Bruce Wayne</name>
5	<generic_identifier>
6	<type_label>Student Number</type_label>
7	<identifier_string>TestCo:156805D</identifier_string>
8	</generic_identifier>
9	<date>
10	<type_label>Exam</type_label>
11	<datetime>2001-08-07T14:00:00</datetime>
12	</date>
13	</context>
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25	<score_min>0</score_min>
26	<score_max>10</score_max>
27	<score_cut>8</score_cut>
28	</score>
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34	</score>
35	</outcomes>
36	<feedback_displayed ident_ref = "Pass">Response</feedback_displayed>
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40	<num_items_attempted>10</num_items_attempted>
41	<num_sections_presented>1</num_sections_presented>
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47	</date>
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53	<score_max>10</score_max>
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55	</score>
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59	<score_max>10</score_max>
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63	<num_items>10</num_items>
64	<num_sections>2</num_sections>
65	<num_items_presented>10</num_items_presented>
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67	<num_sections_presented>2</num_sections_presented>
68	<section_result asi_title = "Example Section Title"
69	ident_ref = "IMS_QTIV1p2_S_SAO_11p1" presented = "Yes">
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71	<asi_metadatafield>
72	<field_name>qmd_numberofitems</field_name>
73	<field_value>4</field_value>
74	</asi_metadatafield>
75	</asi_metadata>
76	<date>
77	<type_label>Section Creation Time</type_label>
78	<datetime>2001-08-07T13:30:00</datetime>
79	</date>
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81	<outcomes>
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84	<score_min>0</score_min>
85	<score_max>4</score_max>
86	<score_cut>3</score_cut>
87	</score>
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93	</score>
94	</outcomes>
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96	<num_sections>0</num_sections>
97	<num_items_presented>4</num_items_presented>
98	<num_items_attempted>4</num_items_attempted>
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105	</asi_metadatafield>
106	<asi_metadatafield>
107	<field_name>qmd_topic</field_name>
108	<field_value>qtiv1p2test</field_value>
109	</asi_metadatafield>
110	</asi_metadata>
111	<date>
112	<type_label>Item Creation Time</type_label>
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118	timing = "No" response_type = "lid">

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120         <correct_response>B</correct_response>
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124     <response_value response_status = "Valid">B</response_value>
125 </response>
126 <outcomes>
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129         <score_min>0</score_min>
130         <score_max>1</score_max>
131     </score>
132     <score varname = "CORRECT" vartype = "Boolean">
133         <score_value>True</score_value>
134     </score>
135 </outcomes>
136 <feedback_displayed ident_ref = "Correct">Response
137 </feedback_displayed>
138 </item_result>
139 <item_result ident_ref = "IMS_QTIV1p2_I_SAO_08" presented = "Yes">
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141         <asi_metadatafield>
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143             <field_value>basic</field_value>
144         </asi_metadatafield>
145         <asi_metadatafield>
146             <field_name>qmd_topic</field_name>
147             <field_value>qtiv1p2test</field_value>
148         </asi_metadatafield>
149     </asi_metadata>
150     <date>
151         <type_label>Item Creation Time</type_label>
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157             timing = "No" response_type = "lid">
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159         </response_form>
160         <num_attempts>1</num_attempts>
161         <response_value response_status = "Valid">T</response_value>
162     </response>
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166             <score_min>0</score_min>
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168         </score>
169         <score varname = "CORRECT" vartype = "Boolean">
170             <score_value>True</score_value>
171         </score>
172     </outcomes>
173     <feedback_displayed ident_ref = "Correct">Response
174 </feedback_displayed>
175 </item_result>
176 <item_result ident_ref = "IMS_QTIV1p2_I_SAO_09" presented = "Yes">
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178         <asi_metadatafield>

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179	<field_name>qmd_levelofdifficulty</field_name>
180	<field_value>advanced</field_value>
181	</asi_metadatasfield>
182	<asi_metadatasfield>
183	<field_name>qmd_topic</field_name>
184	<field_value>qativlp2test</field_value>
185	</asi_metadatasfield>
186	</asi_metadatas>
187	<date>
188	<type_label>Item Creation Time</type_label>
189	<datetime>2001-08-07T13:35:00</datetime>
190	</date>
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192	<response ident_ref = "TF03">
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194	timing = "No" response_type = "lid">
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196	</response_form>
197	<num_attempts>1</num_attempts>
198	<response_value>F</response_value>
199	</response>
200	<outcomes>
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203	<score_min>0</score_min>
204	<score_max>1</score_max>
205	</score>
206	<score varname = "SCORE" vartype = "Boolean">
207	<score_value>True</score_value>
208	</score>
209	</outcomes>
210	<feedback_displayed ident_ref = "Correct">Response
211	</feedback_displayed>
212	</item_result>
213	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_10" presented = "Yes">
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217	<field_value>advanced</field_value>
218	</asi_metadatasfield>
219	<asi_metadatasfield>
220	<field_name>qmd_topic</field_name>
221	<field_value>qativlp2test</field_value>
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223	</asi_metadatas>
224	<date>
225	<type_label>Item Creation Time</type_label>
226	<datetime>2001-08-07T13:37:00</datetime>
227	</date>
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229	<response ident_ref = "TF04">
230	<response_form cardinality = "single" render_type = "choice"
231	timing = "No" response_type = "lid">
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233	</response_form>
234	<num_attempts>1</num_attempts>
235	<response_value response_status = "Valid">F</response_value>
236	</response>
237	<outcomes>
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239         <score_value>0</score_value>
240         <score_min>0</score_min>
241         <score_max>1</score_max>
242     </score>
243     <score varname = "CORRECT" vartype = "Boolean">
244         <score_value>False</score_value>
245     </score>
246 </outcomes>
247 <feedback_displayed ident_ref = "Incorrect">Response
248 </feedback_displayed>
249 </item_result>
250 </section_result>
251 <section_result asi_title = "Example Section Title"
252     ident_ref = "IMS_QTIV1p2_S_SAO_11p2" presented = "Yes">
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254         <asi_metadatafield>
255             <field_name>qmd_numberofitems</field_name>
256             <field_value>6</field_value>
257         </asi_metadatafield>
258     </asi_metadata>
259     <date>
260         <type_label>Section Creation Time</type_label>
261         <datetime>2001-08-07T13:30:00</datetime>
262     </date>
263     <control hint_switch="No" solution_switch="No" feedback_switch = "No"/>
264     <outcomes>
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266             <score_value>6</score_value>
267             <score_min>0</score_min>
268             <score_max>6</score_max>
269             <score_cut>5</score_cut>
270         </score>
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275             <score_cut>5</score_cut>
276         </score>
277     </outcomes>
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279     <num_sections>0</num_sections>
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281     <num_items_attempted>6</num_items_attempted>
282     <num_sections_presented>0</num_sections_presented>
283     <item_result ident_ref = "IMS_QTIV1p2_I_SAO_01" presented = "Yes">
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285             <asi_metadatafield>
286                 <field_name>qmd_levelofdifficulty</field_name>
287                 <field_value>advanced</field_value>
288             </asi_metadatafield>
289             <asi_metadatafield>
290                 <field_name>qmd_topic</field_name>
291                 <field_value>qtiv1p2test</field_value>
292             </asi_metadatafield>
293         </asi_metadata>
294         <date>
295             <type_label>Item Creation Time</type_label>
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297         </date>
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303	<correct_response>D</correct_response>
304	<correct_response>E</correct_response>
305	</response_form>
306	<num_attempts>1</num_attempts>
307	<response_value response_status = "Valid">A</response_value>
308	<response_value response_status = "Valid">D</response_value>
309	<response_value response_status = "Valid">E</response_value>
310	</response>
311	<outcomes>
312	<score varname = "SCORE" vartype = "Integer" status = "Valid">
313	<score_value>1</score_value>
314	<score_min>0</score_min>
315	<score_max>1</score_max>
316	</score>
317	<score varname = "CORRECT" vartype = "Boolean">
318	<score_value>1</score_value>
319	<score_min>0</score_min>
320	<score_max>1</score_max>
321	</score>
322	</outcomes>
323	<feedback_displayed ident_ref = "Correct">Response
324	</feedback_displayed>
325	</item_result>
326	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_03" presented = "Yes">
327	<asi_metadata>
328	<asi_metadatafield>
329	<field_name>qmd_levelofdifficulty</field_name>
330	<field_value>basic</field_value>
331	</asi_metadatafield>
332	<asi_metadatafield>
333	<field_name>qmd_topic</field_name>
334	<field_value>qtivlp2test</field_value>
335	</asi_metadatafield>
336	</asi_metadata>
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344	timing = "No" response_type = "lid">
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346	</response_form>
347	<num_attempts>1</num_attempts>
348	<response_value response_status = "Valid">T</response_value>
349	</response>
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353	<score_min>0</score_min>
354	<score_max>1</score_max>
355	</score>
356	<score varname = "CORRECT" vartype = "Boolean">
357	<score_value>True</score_value>
358	</score>



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359         </outcomes>
360         <feedback_displayed ident_ref = "Correct">Response
361         </feedback_displayed>
362     </item_result>
363     <item_result ident_ref = "IMS_QTIVlp2_I_SAO_04" presented = "Yes">
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368             </asi_metadatafield>
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370                 <field_name>qmd_topic</field_name>
371                 <field_value>qtivlp2test</field_value>
372             </asi_metadatafield>
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386         </response>
387         <outcomes>
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394                 <score_value>True</score_value>
395             </score>
396         </outcomes>
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398         </feedback_displayed>
399     </item_result>
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419         <correct_response>D</correct_response>
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428         <score_max>1</score_max>
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432     </score>
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435 </feedback_displayed>
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441             <field_value>basic</field_value>
442         </asi_metadatafield>
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445             <field_value>qtivlp2test</field_value>
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458             <correct_response>C</correct_response>
459             <correct_response>D</correct_response>
460             <correct_response>E</correct_response>
461             <correct_response>F</correct_response>
462         </response_form>
463         <num_attempts>1</num_attempts>
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466         <response_value response_status = "Valid">C</response_value>
467         <response_value response_status = "Valid">D</response_value>
468         <response_value response_status = "Valid">E</response_value>
469         <response_value response_status = "Valid">F</response_value>
470     </response>
471     <outcomes>
472         <score varname = "SCORE" vartype = "Integer">
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474             <score_min>0</score_min>
475             <score_max>1</score_max>
476         </score>
477         <score varname = "CORRECT" vartype = "Boolean">
478             <score_value>True</score_value>

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479         </score>
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490             <field_value>qtivlp2test</field_value>
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493     <date>
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500             timing = "No" response_type = "lid">
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502             <correct_response>B</correct_response>
503         </response_form>
504         <num_attempts>1</num_attempts>
505         <response_value response_status = "Valid">A</response_value>
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507     </response>
508     <outcomes>
509         <score varname = "SCORE" vartype = "Integer" status = "Valid">
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511             <score_min>0</score_min>
512             <score_max>1</score_max>
513         </score>
514         <score varname = "CORRECT" vartype = "Boolean">
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516         </score>
517     </outcomes>
518     <feedback_displayed ident_ref = "Correct">Response
519 </feedback_displayed>
520 </item_result>
521 </section_result>
522 </section_result>
523 <section_result asi_title = "Example Section Title"
524     ident_ref = "IMS_QTIVlp2_S_SAO_12" presented = "No">
525     <date>
526         <type_label>Section Creation Time</type_label>
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528     </date>
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534     <num_sections_presented>0</num_sections_presented>
535     <section_result asi_title = "Example Section Title"
536         ident_ref = "IMS_QTIVlp2_S_SAO_12p1" presented = "Yes">
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538             <asi_metadatafield>

```

539	<field_name>qmd_numberofitems</field_name>
540	<field_value>4</field_value>
541	</asi_metadatafield>
542	</asi_metadata>
543	<date>
544	<type_label>Section Creation Time</type_label>
545	<datetime>2001-08-07T13:30:00</datetime>
546	</date>
547	<control hint_switch="No" solution_switch="No" feedback_switch="No"/>
548	<num_items>4</num_items>
549	<num_sections>0</num_sections>
550	<num_items_presented>0</num_items_presented>
551	<num_items_attempted>0</num_items_attempted>
552	<num_sections_presented>0</num_sections_presented>
553	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_02" presented = "No">
554	<asi_metadata>
555	<asi_metadatafield>
556	<field_name>qmd_levelofdifficulty</field_name>
557	<field_value>basic</field_value>
558	</asi_metadatafield>
559	<asi_metadatafield>
560	<field_name>qmd_topic</field_name>
561	<field_value>qtivlp2test</field_value>
562	</asi_metadatafield>
563	</asi_metadata>
564	<date>
565	<type_label>Item Creation Time</type_label>
566	<datetime>2001-08-07T13:31:00</datetime>
567	</date>
568	<duration>P0Y0M0DT0H2M</duration>
569	<response ident_ref = "LID02">
570	<response_form cardinality = "multiple" render_type = "choice"
571	timing = "No" response_type = "lid">
572	<correct_response>A</correct_response>
573	<correct_response>B</correct_response>
574	</response_form>
575	</response>
576	</item_result>
577	<item_result ident_ref = "IMS_QTIVlp2_I_SAO_08" presented = "No">
578	<asi_metadata>
579	<asi_metadatafield>
580	<field_name>qmd_levelofdifficulty</field_name>
581	<field_value>basic</field_value>
582	</asi_metadatafield>
583	<asi_metadatafield>
584	<field_name>qmd_topic</field_name>
585	<field_value>qtivlp2test</field_value>
586	</asi_metadatafield>
587	</asi_metadata>
588	<date>
589	<type_label>Item Creation Time</type_label>
590	<datetime>2001-08-07T13:33:00</datetime>
591	</date>
592	<duration>P0Y0M0DT0H2M</duration>
593	<response ident_ref = "TF02">
594	<response_form cardinality = "single" render_type = "choice"
595	timing = "No" response_type = "lid">
596	<correct_response>T</correct_response>
597	</response_form>
598	</response>

```

599         </item_result>
600         <item_result ident_ref = "IMS_QTIV1p2_I_SAO_09" presented = "No">
601             <asi_metadata>
602                 <asi_metadatafield>
603                     <field_name>qmd_levelofdifficulty</field_name>
604                     <field_value>advanced</field_value>
605                 </asi_metadatafield>
606                 <asi_metadatafield>
607                     <field_name>qmd_topic</field_name>
608                     <field_value>qtiv1p2test</field_value>
609                 </asi_metadatafield>
610             </asi_metadata>
611             <date>
612                 <type_label>Item Creation Time</type_label>
613                 <datetime>2001-08-07T13:35:00</datetime>
614             </date>
615             <duration>P0Y0M0DT0H2M</duration>
616             <response ident_ref = "TF03">
617                 <response_form cardinality = "single" render_type = "choice"
618                     timing = "No" response_type = "lid">
619                     <correct_response>F</correct_response>
620                 </response_form>
621             </response>
622         </item_result>
623         <item_result ident_ref = "IMS_QTIV1p2_I_SAO_10" presented = "Yes">
624             <asi_metadata>
625                 <asi_metadatafield>
626                     <field_name>qmd_levelofdifficulty</field_name>
627                     <field_value>advanced</field_value>
628                 </asi_metadatafield>
629                 <asi_metadatafield>
630                     <field_name>qmd_topic</field_name>
631                     <field_value>qtiv1p2test</field_value>
632                 </asi_metadatafield>
633             </asi_metadata>
634             <date>
635                 <type_label>Item Creation Time</type_label>
636                 <datetime>2001-08-07T13:37:00</datetime>
637             </date>
638             <duration>P0Y0M0DT0H2M</duration>
639             <response ident_ref = "TF04">
640                 <response_form cardinality = "single" render_type = "choice"
641                     timing = "No" response_type = "lid">
642                     <correct_response>T</correct_response>
643                 </response_form>
644             </response>
645         </item_result>
646     </section_result>
647     <section_result asi_title = "Example Section Title"
648         ident_ref = "IMS_QTIV1p2_S_SAO_12p2" presented = "Yes">
649         <asi_metadata>
650             <asi_metadatafield>
651                 <field_name>qmd_numberofitems</field_name>
652                 <field_value>3</field_value>
653             </asi_metadatafield>
654         </asi_metadata>
655         <date>
656             <type_label>Section Creation Time</type_label>
657             <datetime>2001-08-07T13:30:00</datetime>
658         </date>

```

```

659      <control hint_switch= "No" solution_switch="No" feedback_switch= "No"/>
660      <num_items>3</num_items>
661      <num_sections>0</num_sections>
662      <num_items_presented>0</num_items_presented>
663      <num_items_attempted>0</num_items_attempted>
664      <num_sections_presented>0</num_sections_presented>
665      <item_result ident_ref = "IMS_QTIVlp2_I_SAO_01" presented = "No">
666          <asi_metadata>
667              <asi_metadatafield>
668                  <field_name>qmd_levelofdifficulty</field_name>
669                  <field_value>advanced</field_value>
670              </asi_metadatafield>
671              <asi_metadatafield>
672                  <field_name>qmd_topic</field_name>
673                  <field_value>qtivlp2test</field_value>
674              </asi_metadatafield>
675          </asi_metadata>
676          <date>
677              <type_label>Item Creation Time</type_label>
678              <datetime>2001-08-07T13:31:00</datetime>
679          </date>
680          <duration>P0Y0M0DT0H2M</duration>
681          <response ident_ref = "LID01">
682              <response_form cardinality = "multiple" render_type = "choice"
683                  timing = "No" response_type = "lid">
684                  <correct_response>A</correct_response>
685                  <correct_response>D</correct_response>
686                  <correct_response>E</correct_response>
687              </response_form>
688          </response>
689      </item_result>
690      <item_result ident_ref = "IMS_QTIVlp2_I_SAO_03" presented = "No">
691          <asi_metadata>
692              <asi_metadatafield>
693                  <field_name>qmd_levelofdifficulty</field_name>
694                  <field_value>basic</field_value>
695              </asi_metadatafield>
696              <asi_metadatafield>
697                  <field_name>qmd_topic</field_name>
698                  <field_value>qtivlp2test</field_value>
699              </asi_metadatafield>
700          </asi_metadata>
701          <date>
702              <type_label>Item Creation Time</type_label>
703              <datetime>2001-08-07T13:33:00</datetime>
704          </date>
705          <duration>P0Y0M0DT0H2M</duration>
706          <response ident_ref = "TF01">
707              <response_form cardinality = "single" render_type = "choice"
708                  timing = "No" response_type = "lid">
709                  <correct_response>T</correct_response>
710              </response_form>
711          </response>
712      </item_result>
713      <item_result ident_ref = "IMS_QTIVlp2_I_SAO_04" presented = "No">
714          <asi_metadata>
715              <asi_metadatafield>
716                  <field_name>qmd_levelofdifficulty</field_name>
717                  <field_value>advanced</field_value>
718              </asi_metadatafield>

```

719	<code>&lt;asi_metadatafield&gt;</code>
720	<code>&lt;field_name&gt;qmd_topic&lt;/field_name&gt;</code>
721	<code>&lt;field_value&gt;qti_vlp2test&lt;/field_value&gt;</code>
723	<code>&lt;/asi_metadatafield&gt;</code>
724	<code>&lt;/asi_metadata&gt;</code>
725	<code>&lt;date&gt;</code>
726	<code>&lt;type_label&gt;Item Creation Time&lt;/type_label&gt;</code>
727	<code>&lt;datetime&gt;2001-08-07T13:37:00&lt;/datetime&gt;</code>
728	<code>&lt;/date&gt;</code>
729	<code>&lt;duration&gt;P0Y0M0DT0H2M&lt;/duration&gt;</code>
730	<code>&lt;response ident_ref = "LID03"&gt;</code>
731	<code>&lt;response_form cardinality = "single" render_type = "choice"</code>
732	<code>timing = "No" response_type = "lid"&gt;</code>
733	<code>&lt;correct_response&gt;B&lt;/correct_response&gt;</code>
734	<code>&lt;/response_form&gt;</code>
735	<code>&lt;/response&gt;</code>
736	<code>&lt;/item_result&gt;</code>
737	<code>&lt;/section_result&gt;</code>
738	<code>&lt;/section_result&gt;</code>
739	<code>&lt;/assessment_result&gt;</code>
740	<code>&lt;/result&gt;</code>
741	<code>&lt;/qti_result_report&gt;</code>

This example is available in the file: 'ims\_qtiresv1p2/item/qtires\_sc\_assess03.xml'. The key points to note are:

- A report is made for all of the Items and Section irrespective of whether they were presented to the participant;
- Outcomes and actual response are not reported for the Section and Items that were not presented.

## 6. QTI Results Reporting & Other Relevant Specifications

### 6.1 IMS Specifications

#### 6.1.1 Meta-data

The IMS QTI Result Reporting specification supports the inclusion of meta-data within the XML instance using the *asi\_metadata* element. This mechanism uses a vocabulary-based approach. The intended usage of this mechanism is to enable the meta-data from the original evaluation structure (an Assessment, Section, Item, Object-bank, or proprietary structure) to be reported back thereby enabling the receiving system to search through the results using that meta-data.

The alternative method for assigning meta-data is to use the IMS Content Packaging specification [CP, 01a], [CP, 01b], [CP, 01c] to enclose the IMS QTI Results Reporting structure – see Sub-section 6.1.2. The IMS Content Packaging specification allows IMS Meta-data to be assigned to any resource and so the appropriate IMS QTI object should be defined as a Content Package resource. The granularity of the allocation of the meta-data using the IMS Content Packaging mechanism is determined by the actual resource allocation and so it is not possible to define an Assessment result as a resource and then assign IMS Meta-data to any contained Section result and/or Item result.

#### 6.1.2 Content Packaging

An IMS QTI Results Report can be packaged using the IMS Content Packaging specification in two ways:

- The entire results report XML instance can be inserted as a single resource with all of the externally referenced files packaged as associated resources;
- The actual results report XML can be inserted into the content package. This requires the usage of the IMS QTI Results Report XML schema form of the XML binding. This schema has to have its own namespace identified in the content packaging XML instance. All of the externally referenced files are once again packaged as associated resources.

#### 6.1.3 Learner Information Packaging

The IMS LIP specification can also be used to exchange results information. However, the IMS LIP specification is focused on the exchange of information concerning personal profiles and not detailed assessment information. Whilst the IMS LIP could be used to pass any of the detailed scoring data within the IMS QTI Results Reporting information the representation of that information is considerably more abstract and the IMS LIP cannot be used to pass the non-scoring information e.g. the associated meta-data, objectives, etc.

It is envisaged that one of the ways in which the IMS QTI Results and IMS LIP specifications would interact is as follows:

- The assessment control system receives the student data configuration information from the profile server using the IMS LIP. The individual profile for each candidate will be required;
- The assessment system then generates the actual assessments that the candidates then complete. The original Assessment may be sent from the assessment control system to the assessment engine and then onto the client renderer using the IMS QTI ASI specification. The results from the rendering engine may be reported back to the assessment engine and then onto the assessment control system using the IMS QTI Results specification;
- The assessment control system will then report the individual assessment results to the profile server using the IMS LIP specification features. Each student's profile will be updated according to their own performance on the Assessment;
- The assessment control system could then report the full set of detailed results to some centralized assessment collation and evaluation system. This reporting could be achieved using the IMS QTI Results specification.



## 6.2 Other Specifications

### 6.2.1 ADL SCORM

The IMS QTI Results Reporting specification has been designed to ensure that it can be used to support the CMI interactions as defined in SCORM. The mapping between the CMI interactions and the IMS QTI Results Reporting specification is shown in Table 6.1<sup>1</sup>.

**Table 6.1 SCORM CMI Interactions mapping to the IMS QTI Results Reporting specification.**

CMI Interaction <sup>a</sup>	IMS QTI Results Equivalent	Comments
_children	N/A	Not mapped because this element is tied to the SCORM communications/transport binding.
_count	N/A	Not mapped because this element is tied to the SCORM communications/transport binding.
n.id	<qti_result> <result> <item_result ident_ref="n.id">	
n.objectives	<qti_result> <result> <item_result> <objective> <i>n.objectives</i>	In SCORM, this element represents a relation to the Learning objective(s) to which the interaction is related. In IMS QTI, objectives are the objective of the assessment item itself. If these are designed to be equivalent then the mapping is valid.
n.objectives._count	N/A	Not mapped because this element is tied to the SCORM communications/transport binding.
n.objectives.n.id	<qti_result> <result> <item_result> <extension_item_result>	There is no equivalent identifier. The extension mechanism must be used.
n.time	<qti_result> <result> <item_result> <date> <datetime> <i>n.time</i>	The IMS QTI <datetime> supports the date and time. Only the time component is required by the CMI.
n.type	<qti_result> <result> <item_result> <response> <response_form>	This mapping must use the 'extension' value for the attribute response_type on <response_form>.

1. This table is based upon a report completed by Ron Ball from ADL on 20<sup>th</sup> August, 2001.

n.correct.responses	<qti_result> <result> <item_result> <response> <response_form> <correct_response> <i>n.correct.response_1</i> ... <correct_response> <i>n.correct.response_n</i>	
n.correct_responses._count	N/A	Not mapped because this element is tied to the SCORM communications/transport binding.
n.correct_responses.n.pattern	<qti_result> <result> <item_result> <response> <response_form> <extension_responseform>	The CMI pattern is the full set of responses that can be supplied by the user e.g. all of the choices available as a multiple choice question. There is no direct mapping equivalent. The extension mechanism must be used.
n.weighting	<qti_result> <result> <item_result> <asi_metadata> <field_name> <i>qmd_weighting</i> <field_value> <i>n.weighting</i>	
n.student_reponses	<qti_result> <result> <item_result> <response> <response_value> <i>n.student_reponse_1</i> ... <response_value> <i>n.student_reponse_n</i>	
n.result	<qti_result> <result> <item_result> <outcomes> <score> <score_value>	
n.latency	<qti_result> <result> <item_result> <duration>	The 'n.latency' is the time taken by the user to supply a particular response once the question has been presented. This is only equivalent to the <duration> if the Item has a single response structure.

a. All of the entries in this column are assumed to start with: 'cmi.interactions.'.

## 7. Implementation Guidance

### 7.1 Nomenclature

The key terms that are used within a results report are:

- Evaluation – this is the generic term that is used to identify any form of assessment based upon any of the IMS QTI core objects (the ASIs) or other proprietary mechanisms. Therefore, an evaluation could range from a single question to a full high-stakes test;
- Results report – this is the generic term to identify the structure that contains the results being reported using the IMS QTI Results Reporting specification. This report, in the form of the corresponding QTI-XML instance, can range from a summary of an evaluation to the detailed report of a high-stakes Assessment containing a complex combination of Sections and Items;
- IMS QTI-specific metadata – this refers to the meta-data that is specific to the IMS QTI specifications and that uses the corresponding vocabulary. It specifically excludes the meta-data fields as defined in the IMS Meta-data specification. The IMS QTI-specific meta-data is defined using a special vocabulary.

### 7.2 Using the Core Data Structures

#### 7.2.1 <result>

The <result> structure is used to contain each evaluation report and to bind that information to the associated context that describes the conditions under which the evaluation was taken. Multiple <result> structures can be reported in each <qti\_result\_report> and these can be used to report:

- Multiple results for a single individual e.g. the reports for a set of tests undertaken by a single individual – leading to the development of a personal assessment profile;
- Multiple results for a single test undertaken by several participants – the classic examination environment;
- Any combination of the above two plus any other usage. However, mixed usage will require the exchanging system to have an appropriate set of transaction rules.

An issue that must be considered is the most effective way in which a complex structure is reported e.g. an Assessment consisting of several Sections each of which consist of several Items. The two ways in which this could be reported are:

- As a single Assessment result in which the component Section and Items are reported as sub-structures to the Assessment;
- As multiple <result> structures in which each of the Assessment, Section and Items are reported in their own result report. The linkage between these structures must then be managed by the communicating systems by operating on the data object identifiers and using the original ASI structure to construct the object hierarchy.

The four result structures that can be exchanged are (these are split into those that conform to the IMS QTI ASI structures and those that use a different evaluation construction mechanism):

- Summary – a set of information that is used to summarize the evaluation. This cannot consist of sub-structures. A summary report could consist of the same information as any one of the other structures in which only the top-level object information is reported;
- ASI Assessment or equivalent – the equivalent of a test. This would typically be used in high-stakes systems. The Assessment will almost certainly contain Sections or their equivalent;
- ASI Section or equivalent – the hierarchical grouping structure. The significance of this structure in the evaluation is defined by the context in which it is used i.e. how is the Section used within the educational paradigm being used. The Section may contain other Sections and will certainly contain Items or their equivalents;

- ASI Item or equivalent – the core evaluation component i.e. the container for the actual question. The SCORM equivalent would be an ‘interaction’.

### 7.2.2 <context>

The <context> structure is used to contain the information that sets the context for the results that are reported in the associated data structure e.g. the Summary result, Assessment result, etc. The <context> is mandatory, only one entry is permitted for each result structure, and is used to supply the following information:

- The name of the candidate. The name should be supplied in an agreed formatted style;
- Any generic identifier that is used to identify any facet of the evaluation procedure e.g. a unique identifier for the candidate, the identifier of the evaluation system, the identifier assigned to the evaluation host, etc. The vocabularies for the identifier have not been defined;
- Any dates that are relevant to the evaluation e.g. the time at which the evaluation was sat, the date after which the validity of the results expire, etc.

The current <context> structure does not supply information about the actual results being summarized e.g. there is no indicator of the type of result about to be reported. If this ‘header’ type of information is required then the extension mechanism (<extension\_context>) should be used.

### 7.2.3 <summary\_result>

The <summary\_result> structure is used to contain a generic summary of an evaluation e.g. a test. The summary is composed of an identifier, dates relevant to the evaluation, the status of the summary report, the time taken to complete the evaluation, and the scores and grades achieved by the participant. The summary structure contains no summary information on the structure of the evaluation e.g. the number of Items presented, the number of section presented, etc. Any number of scores and grades can be reported but it is expected that the summary is more likely to report a single score and/or grade reflecting the mastery, or otherwise, of the topic being examined.

### 7.2.4 <assessment\_result>

The <assessment\_result> structure is designed to report results from Assessments as defined under the IMS QTI ASI specifications. To this end the following structures are used to report the Assessment features:

- ident\_ref – contains the original globally unique identifier assigned to the Assessment (every Assessment must have an identifier);
- asi\_title – contains the original title labelling the Assessment (this is an optional field in the ASI);
- <asi\_metadata> – contains the reported meta-data that was significant to the way in which the Assessment was used e.g. for selection and ordering, outcomes processing, etc.
- <asi-description> – this is used to contain, or reference, a description of the actual Assessment being undertaken. Whenever possible this reference should link back to the original Assessment QTI-XML instance;
- <date> and <duration> – these are used to contain the key date/time information about the Assessment e.g. time the Assessment was undertaken, and the duration of the Assessment. Both data sets conform to the ISO8601 standard;
- <objective> – this is used to contain, or reference, the objectives identified within the Assessment being undertaken. This information could be used to identify the competencies achieved by mastery of the subject covered by the Assessment;
- <control> – this is used to indicate if hints, solutions and response feedback were made available to the candidate;
- <outcomes> – this contains the detailed values assigned to the Assessment score and grade variables. Any number of such variables can be reported. An extensive set of information about each variable can be reported and this should be used as comprehensive as possible;
- <feedback\_displayed> – this is used to contain, or reference, the feedback that was displayed to the candidate;

- `<section_result>` – this is used to contain the result report for any contained Sections. An Assessment must contain a Section and so a detailed report of the Assessment should always be accompanied by at least one Section result report.

The other structures are used to report summary information concerning the sub-structures used within the Assessment, namely:

- `<num_items>` – this is the total number of Items, throughout the entire hierarchy, that are either contained or referenced by the Assessment, irrespective of whether they are actually presented and/or attempted by the candidate;
- `<num_sections>` – this is the total number of top-level Sections that are either contained or referenced by the Assessment, irrespective of whether they are actually presented and/or attempted by the candidate. Any Sections contained within a Section are not counted in this total;
- `<num_items_presented>` – this is the total number of Items that were selected for presentation to the candidate;
- `<num_items_attempted>` – this is the total number of Items that were attempted by the candidate (this number will be less than or equal to `<num_items_presented>`). For the sake of this total, multiple attempts of an Item by the candidate are counted as a single attempt. An Item is defined as attempted if the candidate submits an answer using some local mechanism that clearly denotes the explicit submission/selection of an answer;
- `<num_sections_presented>` – this is the number of top-level Sections that were selected for presentation to the candidate. Sections within Sections do not count towards this total. A Section is counted as presented even if none of the contained objects were actually attempted by the candidate.

It is an implementation issue whether or not information concerning contained or referenced Sections and Items that were not presented are reported. If these objects are reported then the values for `<num_items_presented>`, `<num_items_attempted>` and `<num_sections_presented>` are set to zero.

Assessments that do not conform to the IMS QTI ASI specification should make use of the above structures in ways that are consistent with their definitions.

### 7.2.5 `<section_result>`

The `<section_result>` structure is designed to report results from Sections as defined under the IMS QTI ASI specifications. To this end the following structures are used to report the Section features:

- `ident_ref` – contains the original globally unique identifier assigned to the Section (every Section must have an identifier);
- `asi_title` – contains the original title labelling the Section (this is an optional field in the ASI);
- `<asi_metadata>` – contains the reported meta-data that was significant to the way in which the Section was used e.g. for selection and ordering, outcomes processing, etc.
- `<asi-description>` – this is used to contain, or reference, a description of the actual Section being undertaken. Whenever possible this reference should link back to the original Section QTI-XML instance;
- `<date>` and `<duration>` – these are used to contain the key date/time information about the Section e.g. time the Section was undertaken, and the duration of the Section. Both data sets conform to the ISO8601 standard;
- `<objective>` – this is used to contain, or reference, the objectives identified within the Section being undertaken. This information could be used to identify the competencies achieved by mastery of the subject covered by the Section;
- `<control>` – this is used to indicate if hints, solutions and response feedback were made available to the candidate;
- `<outcomes>` – this contains the detailed values assigned to the Section score and grade variables. Any number of such variables can be reported. An extensive set of information about each variable can be reported and this should be used as comprehensive as possible;
- `<feedback_displayed>` – this is used to contain, or reference, the feedback that was displayed to the candidate;
- `<section_result>` – this is used to contain the result report for any contained Sections;
- `<item_result>` – this is used to contain the result report for any contained Items.

The other structures are used to report summary information concerning the sub-structures used within the Section, namely:

- `<num_items>` – this is the total number of Items, throughout the entire hierarchy, that are either contained or referenced by the Section, irrespective of whether they are actually presented and/or attempted by the candidate;
- `<num_sections>` – this is the total number of top-level Sections that are either contained or referenced by the Section, irrespective of whether they are actually presented and/or attempted by the candidate. Any Sections contained within any of the sub-Sections are not counted in this total;
- `<num_items_presented>` – this is the total number of Items that were selected for presentation to the candidate;
- `<num_items_attempted>` – this is the total number of Items that were attempted by the candidate (this number will be less than or equal to `<num_items_presented>`). For the sake of this total, multiple attempts of an Item by the candidate are counted as a single attempt. An Item is defined as attempted if the candidate submits an answer using some local mechanism that clearly denotes the explicit submission/selection of an answer;
- `<num_sections_presented>` – this is the number of top-level Sections that were selected for presentation to the candidate. Sub-Sections within Sections do not count towards this total. A Section is counted as presented even if none of the contained objects were actually attempted by the candidate.

It is an implementation issue whether or not information concerning contained or referenced Sections and Items that were not presented are reported. If these objects are reported then the values for `<num_items_presented>`, `<num_items_attempted>` and `<num_sections_presented>` are set to zero.

Sections that do not conform to the IMS QTI ASI specification should make use of the above structures in ways that are consistent with their definitions.

### 7.2.6 `<item_result>`

The `<item_result>` structure is designed to report results from Items as defined under the IMS QTI ASI specifications. To this end the following structures are used to report the Item features:

- `ident_ref` – contains the original globally unique identifier assigned to the Item (every Item must have an identifier);
- `asi_title` – contains the original title labelling the Item (this is an optional field in the ASI);
- `<asi_metadata>` – contains the reported meta-data that was significant to the way in which the Item was used e.g. for selection and ordering, outcomes processing, etc.
- `<asi-description>` – this is used to contain, or reference, a description of the actual Item being undertaken. Whenever possible this reference should link back to the original Section QTI-XML instance;
- `<date>` and `<duration>` – these are used to contain the key date/time information about the Item e.g. time the Section was undertaken, and the duration of the Section. Both data sets conform to the ISO8601 standard;
- `<objective>` – this is used to contain, or reference, the objectives identified within the Item being undertaken. This information could be used to identify the competencies achieved by mastery of the subject covered by the Item;
- `<control>` – this is used to indicate if hints, solutions and response feedback were made available to the candidate;
- `<response>` – this is used to contain a detailed description of the actual question being presented, the correct answer to the question and a record of the responses (if attempted by the candidate) made by the candidate;
- `<outcomes>` – this contains the detailed values assigned to the Item score and grade variables. Any number of such variables can be reported. An extensive set of information about each variable can be reported and this should be used as comprehensive as possible;
- `<feedback_displayed>` – this is used to contain, or reference, the feedback that was displayed to the candidate.

Items, e.g. SCORM Interactions that do not conform to the IMS QTI ASI specification should make use of the above structures in ways that are consistent with their definitions.

### 7.2.7 Scores and Grades

The score structure can be used to report the following statistics:

- `<score_value>` – the value awarded to the candidate. The type of value should agree to the type of variable as defined by the ‘vartype’ attribute;
- `<score_interpretation>` – a description of the rules for the interpretation of the score awarded. This will be a textual description and should report any key information for understanding the context of the range of possible scores;
- `<score_min>` – the minimum value that could have been awarded to the candidate. This is only valid for numeric typed variables or ones that are enumerated lists (the first entry being defined as the highest value thus the minimum value will be the last entry);
- `<score_max>` – the maximum value that could have been awarded to the candidate (it will have the same type as the variable). This is only valid for numeric typed variables or ones that are enumerated lists (the first entry being defined as the highest value thus the maximum value will be the first entry);
- `<score_normalized>` – the normalized equivalent of the `<score_value>`. This is normalized using the `<score_min>` and `<score_max>` values and so these must have been defined for the normalized value to be valid. The normalized value is a real number in the range 0-1;
- `<score_average>` – the average value that the candidate could be expected to achieve. The average is a real number whose value lies between `<score_min>` and `<score_max>`. This is a reported value and is not derived from the set of scores awarded to the candidate or set of candidates answering this object;
- `<score_std_error>` – the standard error of the score. The standard error is a real number whose value lies between `<score_min>` and `<score_max>`. This is a reported value and is not derived from the set of scores awarded to the candidate or set of candidates answering this object;
- `<score_reliability>` – the reliability of the score. This is a real number;
- `<score_cut>` – the score which if achieved or surpassed denotes that the topic has been passed, mastered, etc. (it will have the same type as the variable). The cut score is a number between `<score_min>` and `<score_max>`.

The grade structure can be used to report the following statistics:

- `<grade_value>` – the value actually awarded to the candidate. If the set of possible grades has been defined using the ‘members’ attribute then this value must be a member of that set;
- `<grade_cut>` – the grade which if achieved or surpassed denotes that the topic has been passed, mastered, etc. If the set of possible grades has been defined using the ‘members’ attribute then this value must be a member of that set and it is assumed that the set is defined with the highest grade being placed first in the list.

The values for `<score_reliability>` and `<score_std_error>` for the default ‘SCORE’ variable can be obtained from the corresponding IMS QTI-specific meta-data entries.

## 7.3 QTI Results Reporting Meta-data

The `<asi_metadata>` structure within the results structures is used to report the key meta-data fields that were relevant to the original evaluation structures. It is expected that these entries will be identical to those supplied by the associated ASI or equivalent structure. Within the `<asi_metadata>` structure only the vocabulary mechanism for meta-data is supported. Three types of meta-data can be reported:

- IMS QTI-specific meta-data as defined in Table 6.1 [QTI, 02f];
- IMS Meta-data – as defined within the IMS Meta-data specifications [MD, 01a]. [MD, 01b], [MD, 01c];
- Non IMS meta-data – this includes Dublin Core.

### 7.3.1 IMS QTI-Specific Meta-data Support

The following XML code shows how the IMS QTI-specific meta-data is supported:

```

<qti_result_report>
  <context>
    ...
  </context>
  <item_result ident_ref="***...***">
    ...
    <asi_metadata>
      <vocabulary uri="imsqtivlp2_metadata.txt" vocab_type="text/plain"/>
      <asi_metadatafield>
        <field_name>qmd_questiontype</field_name>
        <field_value>Multiple-choice</field_value>
      </asi_metadatafield>
      ...
    </asi_metadata>
    ...
  </item_result>
</qti_result_report>

```

The usage of the <vocabulary> element is good practice but not necessary i.e. the usage of the IMS QTI-specific vocabulary is considered the default condition.

### 7.3.2 IMS Meta-data Support

The following XML code shows how IMS Meta-data is supported:

```

<qti_result_report>
  <context>
    ...
  </context>
  <item_result ident_ref="***...***">
    ...
    <asi_metadata>
      <vocabulary uri="ims_metadatavlp2pl.txt" vocab_type="text/plain"/>
      <asi_metadatafield>
        <field_name>lom:general.title</field_name>
        <field_value>Maths101</field_value>
      </asi_metadatafield>
      ...
    </asi_metadata>
    ...
  </item_result>
</qti_result_report>

```

The usage of the <vocabulary> element must be used to identify the source of the reference vocabulary. The entries in the <field\_name> and <field\_value> elements are a reflection of the associated IMS vocabulary. The 'lom:' namespace should be used in the 'field\_name'.

### 7.3.3 Non-IMS Meta-data Support

The following XML code shows how non-IMS meta-data is supported:

```

<qti_result_report>
  <context>
    ...
  </context>
  <item_result ident_ref="***...***">
    ...
    <asi_metadata>
      <vocabulary uri="dublincore.txt" vocab_type="text/plain"/>
      <asi_metadatafield>
        <field_name>dc:title</field_name>
        <field_value>Maths101</field_value>
      </asi_metadatafield>
    </asi_metadata>
  </item_result>
</qti_result_report>

```



```

        </asi_metadatafield>
    ...
</asi_metadata>
...
</item_result>
</qti_result_report>

```

The usage of the <vocabulary> element must be used to identify the source of the reference vocabulary. The entries in the <field\_name> and <field\_value> elements are a reflection of the associated non-IMS vocabulary. An appropriate namespace should be used in the 'field\_name'.

### 7.3.4 Key IMS QTI-specific Meta-data

The IMS QTI-specific meta-data fields that will common reported are:

**Table 7.1 Commonly reported IMS QTI-specific entries.**

IMS QTI-specific Meta-data Field	Usage
qmd_penaltyvalue	The penalty value that is to be used in the 'GuessingPenalty' scoring algorithm.
qmd_questiontype	The question-type that is being represented.
qmd_scorereliability	The reliability metric that is assigned to the SCORE variable. This should agree with the value in the <score_reliability> element.
qmd_scorestderr	The standard error metric that is assigned to the SCORE variable. This should agree with what is reported in the <score_std_error> element.
qmd_weighting	The weighting that is to be used in the corresponding scoring algorithms.

Other IMS QTI-specific meta-data fields will regularly occur but these will depend upon local implementation issues.

## 7.4 QTI Results Reporting Vocabularies & Taxonomies

At the current time none of the IMS vocabularies and taxonomies have been defined in a formal manner. Such a definition requires:

- The label for the actual vocabulary object;
- The list of the possible entries that can be assigned to the label;
- The constraints that must be applied to the individual entries e.g. the possible range for a numeric entry;
- The agreed representation format for the vocabulary e.g. an XML file, comma separated text file, etc.
- The ways in which the vocabulary is to be linked to the actual object using the vocabulary.

The key vocabulary that is used within the IMS QTI Results Reporting specification is the IMS QTI-specific meta-data. At the current time the IMS QTI-specific meta-data is assumed to be that defined in [QTI, 02f] Table 6.1 and as such it should be assumed to be definitive in nature. Any IMS QTI Results Reporting system must support this as the default vocabulary and should **NOT** require the <vocabulary> element to be used to define the associated source file for this vocabulary.

In many cases the XML DTD could contain the vocabulary as an enumerated attribute list. Unfortunately such structures are not easily extended within a DTD. The full adoption of XML Schema for V2.0 will enable us to support extensible attribute lists hence many vocabularies will then be enforced, at least across the core agreed vocabulary, by the parsing of the XML against the control schema.

## 7.5 Packaging IMS QTI Result Reports

It is recommended that the IMS Content Packaging specification [CP, 01a], [CP, 01b], [Cp, 01c] is used to package the QTI-XML result report instance with its associated files e.g. an externally referenced description file. The approach recommended for the packaging is described in [IMS, 01b]. The IMS Content Packaging mechanism may also be used to package together multiple result reports i.e. each separate results report could be entered as its own resource within the Content package. This approach could also be used as an alternative mechanism to using multiple `<result>` structures within the `<qti_result_report>` root structure.

## 8. Proprietary Extensions

The proprietary extensions facilities listed in Table 8.1 are supported as elements within the specifications:

**Table 8.1 List of proprietary extension elements.**

Extension Element Name	Host Element	Description
extension_assessment_result	assessment_result	Inclusion for new functionality to support the reporting of Assessment results.
extension_context	context	Inclusion for new functionality to support the details of the context of the evaluation report.
extension_grade	grade	Inclusion for new functionality to support the details of a particular grade.
extension_item_result	item_result	Inclusion for new functionality to support the reporting of Item results.
extension_response	response	Inclusion for new functionality to support the details of the possible and given responses for an Item.
extension_responseform	responseform	Inclusion for new functionality to support the details of the actual response structure of the Item.
extension_result	result	Inclusion for new functionality to support the core reporting structure e.g. new types of report as opposed to the current Assessment, Section, Item and Summary.
extension_score	score	Inclusion for new functionality to support the details of a particular score.
extension_section_result	section_result	Inclusion for new functionality to support the reporting of Section results.
extension_summary_result	summary_result	Inclusion for new functionality to support the reporting of Summary results.

**Note:** *These elements are only used if the suppliers of the Results Reports require proprietary features that are not supported by the available range of elements. It is recommended that these elements are used sparingly. Backwards compatibility with proprietary extensions will NOT be guaranteed in future versions of these specifications.*

## 9. V1.x/V2.0 Issues & Compatibility

### 9.1 Functional Requirements

The functional developments to be considered in V2.0 are:

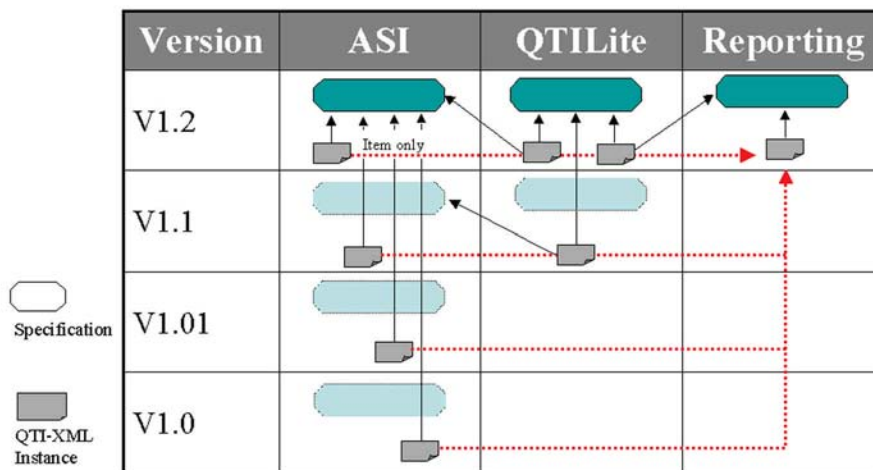
- An adaptive integrated scoring model across the assessment, section and item data structures. The adaptive nature is defined as a dependence on the responses obtained from the user. This model will allow a variety of adaptive aggregation methods between Sections and Items, and Assessments and Sections. The Results Reporting mechanism will have to be sufficiently flexible to report these new adaptive-based features;
- Support for the exchange of tracking information. Tracking information is the data that describes all of the intermediate states entered by the participant e.g. a participant make change their initial answer and so the tracking information would record this intermediate state.

### 9.2 Constraints

V1.2 of the IMS QTI Result Reporting specification is the first release and so there are no issues concerning backwards compatibility. This version of the QTI Results Reporting specification is capable of supporting results obtained from any currently released version of the IMS QTI ASI specifications (v1.0, v1.01, v1.1 and v1.2).

### 9.3 Compatibility Map

The compatibility between all of the current IMS QTI specifications is shown in Figure 9.1. At the current time four versions of the full IMS QTI specification have been released and two versions of the QTILite. Figure 9.1 shows that any 'Item' instance file created under versions 1.0, 1.01 and 1.1 are fully compatible with version 1.2. From the QTILite perspective, any instances created under V1.1 are not backwards compatible. QTILite V1.1 and V1.2 instances are compatible. All QTILite instances are fully compatible with full QTI V1.1 and V1.2.



**Figure 9.1** Compatibility representation of the set of released QTI specifications.

In the case of IMS QTI V1.2 the Sections and Assessments are not backwards compatible with earlier versions of the specification. This is because:

- Selection and ordering capabilities have been included within Assessments and Sections;

- Outcomes processing capabilities have been included within Assessments and Sections;
- Reference and presentation materials storage capabilities have been added to Assessments and Sections.

Also note that V1.2 objects are NOT backwards compatible with any of the other versions. This is because features have been added within V1.2 to support accessibility, namely:

- The <material> element can now contain multiple <altmaterial> elements (previously this was limited to a single occurrence at most). These new instances can also be different language equivalents to the defined material.

In the case of results reporting, this can be used to capture the results from any object defined in QTI ASI V1.0, V1.01, V1.1 and V1.2, as well as for QTILite V1.1 and V1.2.

## 10. Conformance

The purpose of this statement is to provide a mechanism for customers to fairly compare vendors of assessment systems, tools and content. It is **not** mandatory for a vendor to support every feature of the IMS QTI Results Reporting specification, but a vendor must detail their level of support with a “Conformance Statement”. For example vendors may choose to accept or publish IMS QTI results data, but not choose to repackage IMS QTI results data. Compliance is represented by:

- Conformance summary – this is a summary that shows, in colloquial terms, the capabilities of a particular implementation with respect to the IMS QTI Results Reporting specification;
- Interoperability statement – this is a detailed technical checklist that identifies all of the feature capabilities of the implementation in terms of the IMS QTI Results Reporting specification functions.

### 10.1 Valid Data Issues

Vendors claiming conformance shall publish, accept, and/or repackage valid IMS QTI Results Reporting data as defined by the DTD including proprietary extensions where applicable. Vendors claiming their tools publish IMS QTI Results Reports shall export valid IMS QTI data. Vendors claiming their system tools accept IMS QTI Results Reports data shall be able to parse and recognize valid IMS QTI data. Vendors claiming their system tools repackage IMS QTI Results Reports data shall be able “pass through” valid IMS QTI Results Reports data whether the tool recognizes the optional elements or not. Vendors claiming their assessment content conforms to this specification shall provide valid IMS QTI Results Reports data. Publishers claiming their content conforms to IMS QTI Results Reports shall provide valid IMS QTI Results Reports data.

### 10.2 Conformance Summary

Vendors claiming conformance must provide a “Conformance Summary”, detailing their level of conformance, substantially similar to the information shown below, upon a reasonable request from a member of the IMS, or a prospective customer(s). It is expected that this table, a template of which is shown in Table 7.1 of the IMS QTI Results Reporting Information Model [QTI, 02f], is a summary of the information given in the ‘Interoperability statement’. The intention is for the ‘Conformance Summary’ to be informative in nature. Completion of the three columns is intended to reflect:

- Publish – this implies that the XML instance contains the identified elements. If such an element is not ticked then it will not occur within the exported QTI-XML instance(s);
- Accept – it is assumed that the ability to accept the contents of an element is accompanied by the ability to use, and if appropriate, display that content. If this is not the case but the content of the material can be exported then the ‘Repackage’ column can still be ticked;
- Repackage – this is the ability to import QTI-XML instances from one or more sources and to create a new instance that combines the imported information. It is not necessary for the repackaging system to be able to operate on the information supplied.

### 10.3 Interoperability Statement

An example of the detailed ‘Interoperability Statement’ is shown in Tables 7.2a, 7.2b, 7.2c, 7.2d and 7.2e (one for each of the core structures) of the IMS QTI Results Reporting Information model [QTI, 02f]. Compliance to QTI means that at least one of the columns must be completed. Note that the ‘Interoperability Statement’ addresses support for the various elements within the binding. The set of attributes are not considered. Inclusion of conformance with respect to attributes will be considered in later versions of the specification.

It is important that the ‘Interoperability Statement’ is clear in showing what is and, perhaps more importantly, **what is not** supported. The usage of descriptive conformance approach has been adopted to encourage vendors to be as clear as possible when describing the capabilities of their IMS QTI-compliant systems.

## 10.4 Completing a Conformance Statement

There is a close relationship between the ‘Conformance Summary’ and the ‘Interoperability Statement’. The guidelines for completing these tables are:

- An entry of ‘Y’ in the ‘Context’ part of the ‘Conformance Summary’ should be reflected by the accompanying ‘Context Interoperability Statement’. The ‘Conformance Summary’ is only indicates whether or not the Context information is supported – the ‘Context’ structure is mandatory;
- An entry of ‘Y’ in the ‘Summary result’ part of the ‘Conformance Summary’ should be reflected by the accompanying ‘Summary Result Interoperability Statement’. The ‘Conformance Summary’ gives details on the ‘Score’, ‘Grade’ and ‘Outcomes’ parts only of the ‘Interoperability Statement’;
- Any entry of ‘Y’ in the ‘Assessment result’ part of the ‘Conformance Summary’ should be reflected by the accompanying ‘Assessment Result Interoperability Statement’. The ‘Conformance Summary’ gives details on the ‘Outcomes’ and ‘Section’ parts only of the ‘Interoperability Statement’;
- Any entry of ‘Y’ in the ‘Section result’ part of the ‘Conformance Summary’ should be reflected by the accompanying ‘Section Result Interoperability Statement’. The ‘Conformance Summary’ gives details on the ‘Outcomes’ and ‘Item’ parts only of the ‘Interoperability Statement’;
- An Assessment **must** contain a Section and so support for Assessment results must result in completion of both the Assessment and Section parts of the tables;
- Any entry of ‘Y’ in the ‘Item Result support’ part of the ‘Conformance Summary’ should be reflected by the accompanying ‘Result Interoperability Statement’;

## 10.5 An Example Conformance Statement

Table 10.1 shows an example Conformance Summary.

**Table 10.1 QTI Results Report conformance summary.**

	QTI Results Report Conformance Summary (Version 1.2)		
	Publish (export, data)	Accept (import, display)	Repackage Feature
<b>context</b>	N	Y	N
<b>summary_result</b>	N	Y	N
score	–	Y	–
grade	–	Y	–
outcomes	–	Y	–
<b>assessment_result</b>	N	Y	N
outcomes	–	Y	–
section_result	–	Y	–
<b>section_result</b>	N	Y	N
outcomes	–	Y	–
item_result	–	Y	–
<b>item_result</b>	N	Y	N
response	–	Y	–
outcomes	–	Y	–

The system that is described by this summary has the following capabilities:

- It imports QTI-XML instances only i.e. not exporting or repackaging;
- It imports all forms of the IMS QTI results reports i.e. Summary, Item, Section and Assessment.



# Appendix A – QTI Results XSDs and DTDs

## A1 – Overview

The Version 1.2 IMS Question & Test Interoperability Results Reporting XML Schema Definition (XSD) and Document Type Definitions (DTDs) are contained in a directory that has:

- **xm1a** – the directory that contains all of the DTDs and XSDs in native XML Authority format. XML Authority (V2.2.1) is a product supplied by xtensibility Inc;
- **mac** – the directory that contains all of the XSDs and DTDs in text file format. These text files are designed for usage with Macintosh systems;
- **ibm** – the directory that contains all of the Xsds and DTDs in text file format. These text files are designed for usage with PC systems;
- **unix** – the directory that contains all of the XSDs and DTDs in text file format. These text files are designed for usage with Unix systems.

The further directory structure under each of these directories is identical. This further structure is:

- xsds
  - qtifullxsd – full commented XSD
  - qtifullncxsd – full non-commented XSD
- dtds
  - qtifulldtd – full commented DTD
  - qtifullncdtd – full non-commented DTD

Within each of the XSD directories is the file: **ims\_qtiresv1p2.xsd** and within each of the DTD directories is the file: **ims\_qtiresv1p2.dtd**.

This approach means that's the different types of XSD/DTD can be applied without requiring any editing of the associated source XML files. The full directory structure is given in Appendix A of this file.

## A2 – Full Directory Structure

The full directory structure is:

### xm1a

xsds

qtiresfullncxsd

ims\_qtiresv1p2.xsd

qtiresfullxsd

ims\_qtiresv1p2.xsd

dtds

qtiresfullncdtd

ims\_qtiresv1p2.dtd

qtiresfulldtd

ims\_qtiresv1p2.dtd

**mac**

xsd

qtiresfullxsd

ims\_qtiresv1p2.xsd

qtiresfullncxsd

ims\_qtiresv1p2.xsd

dtd

qtiresfulldtd

ims\_qtiresv1p2.dtd

qtiresfullncdtd

ims\_qtiresv1p2.dtd

**unix**

xsd

qtiresfullxsd

ims\_qtiasiv1p2.xsd

qtiresfullncxsd

ims\_qtiasiv1p2.xsd

dtd

qtiresfulldtd

ims\_qtiasiv1p2.dtd

qtiresfullncdtd

ims\_qtiasiv1p2.dtd

**ibm**

xsd

qtiresfullxsd

ims\_qtiasiv1p2.xsd

qtiresfullncxsd

dtd

qtiresfulldtd

ims\_qtiasiv1p2.dtd

qtiresfullncdtd

ims\_qtiasiv1p2.dtd

## Appendix B – Glossary of Terms

### B1 – IMS QTI Elements and Attributes

<b>asi_description</b>	This element is the container for the description of the associated Assessment, Section or Item. This enables the report to either reference the original Item, Section or Assessment XML instance (using the <i>uri</i> or <i>entityref</i> attributes) or to support a brief textual description.
<b>asi_metadata</b>	This is the container for the meta-data descriptions of the corresponding evaluation objects. This meta-data is IMS QTI-specific and should be used in conjunction with the standard IMS Meta-data Specifications.
<b>asi_metadatafield</b>	The <i>asi_metadatafield</i> element is used within the <i>asi_metadata</i> element. It is used to contain each of the actual meta-data fields. These definitions consist of the field label (defined using the <i>field_name</i> element) and the data itself (defined using the <i>field_value</i> element). The vocabulary is identified using the <i>vocabulary</i> element and is applied to all of the <i>asi_metadatafield</i> elements contained within the immediate <i>asi_metadata</i> element.
<b>asi_title</b>	The <i>asi_title</i> attribute is the title that has been assigned to the evaluation object. The title is usually 1-256 characters in length. This could have been assigned to an Assessment, Section or Item using their 'title' attribute.
<b>assessment_result</b>	The <i>assessment_result</i> element is the container for all of the results information pertaining to a particular Assessment. This is the structure that should be used to contain the results reports from evaluation objects based upon the IMS QTI Assessment structure or proprietary Assessment/Test structures that have a similar usage. Each <i>assessment_result</i> is contained within a single <i>result</i> element and so reports for multiple Assessments must use multiple result instances.
<b>cardinality</b>	The <i>cardinality</i> attribute is used by the <i>responseform</i> element to indicate the number and nature of the response actions expected from the user. The enumerated choices are {single   multiple   ordered   extension}. If an IMS QTI-compliant Item is being described the value entered here should reflect the value assigned to the <i>rcardinality</i> attribute of the Item.
<b>context</b>	The <i>context</i> element is used to define the context for the associated results report i.e. the context for either the summary, Item, Section or Assessment report. The context contains the information that describes the instantiation environment of the evaluation e.g. the identifier of the participant, etc.
<b>control</b>	The control element is used to contain the information that describes the state of the hint switch, solution switch and feedback switch for the evaluation object i.e. the Item, Section or Assessment. The attributes <i>hint_switch</i> , <i>feedback_switch</i> and <i>soluton_switch</i> are used to describe if the associated information was revealed.
<b>correct_response</b>	The <i>correct_response</i> element is used within the item-result element to contain the correct answer. The form of the answer could be the label of the correct answer for a multiple-choice Item, or the expect string for a FIB, etc. Each correct answer is stored within its own element (when appropriate, the order of these is used to define the correct order).
<b>date</b>	This element is the container for any date information. It consists of the type of the date (defined using the <i>type_label</i> element) and the actual date information itself (using the <i>datetime element</i> ).
<b>datetime</b>	The actual date and time information. This information conforms to the ISO 8601 i.e. YYYYMMDDTHHMMSS.

<b>duration</b>	The <i>duration</i> element is used within the <i>item_result</i> , <i>section_result</i> and <i>assessment_result</i> elements to define the permitted duration for the corresponding evaluation. The duration is defined as the period between the activity's activation and completion. The ISO 8601 format is used: PnYnMnDTnHnMnS.
<b>entityref</b>	The <i>entityref</i> attribute is used, in some instances, as an alternative to the <i>uri</i> attribute. The key difference is that the <i>entityref</i> refers to an XML entity whose external linkage is bound to the XML instance itself. This binding also allows the XML-capable processes to intelligently handle the material. It is recommended that this attribute be used in preference to the <i>uri</i> attribute.
<b>extension_assessment_result</b>	The <i>extension_assessment_result</i> element is used to contain any extensions functionality for the <i>assessment_result</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_context</b>	The <i>extension_context</i> element is used to contain any extensions functionality for the <i>context</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_grade</b>	The <i>extension_grade</i> element is used to contain any extension functionality for the <i>grade</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_item_result</b>	The <i>extension_item_result</i> element is used to contain any extension functionality for the <i>item_result</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_response</b>	The <i>extension_response</i> element is used to contain any extension functionality for the <i>response</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_responseform</b>	The <i>extension_responseform</i> element is used to contain any extension functionality for the <i>responseform</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_result</b>	The <i>extension_result</i> element is used to contain any extension functionality for the <i>result</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_score</b>	The <i>extension_score</i> element is used to contain any extension functionality for the <i>score</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_section_result</b>	The <i>extension_section_result</i> element is used to contain any extension functionality for the <i>section_result</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.
<b>extension_summary_result</b>	The <i>extension_summary_result</i> element is used to contain any extension functionality for the <i>summary_result</i> element. This facility must be used sparingly because the usage of extensions limits interoperability. All proprietary extensions should follow an appropriate naming convention and namespacing technique.

<b>feedback_displayed</b>	The <i>feedback_displayed</i> element is used to identify the feedback that was presented to the candidate. The content of the element is either 'Response', 'Hint' or 'Solution' depending on the feedback revealed. The actual feedback is identified using the <i>ident_ref</i> and <i>asi_title</i> attributes and reference to the feedback is made using either the <i>uri</i> or <i>entityref</i> attribute.
<b>feedback_switch</b>	The <i>feedback_switch</i> attribute is used to report if feedback was available through the evaluation object i.e. was Feedback display enabled. The possible states are {Yes, No} with 'No' being the default. This switch is used within the <i>control</i> element within the <i>item_result</i> , <i>section_result</i> and <i>assessment_result</i> elements.
<b>field_name</b>	The <i>field_name</i> element is used within the <i>asi_metadatafield</i> element. It is used to contain the label of the associated meta-data. This allows user-defined IMS QTI-specific meta-data to be associated with the evaluation object. The data entry for the label must be contained within the vocabulary (as defined by the <i>vocabulary</i> element) whenever such a vocabulary has been defined. The content is defined as a free format string.
<b>field_value</b>	The <i>field_value</i> element is used within the <i>asi_metadatafield</i> element. It is used to contain the actual value of the meta-data identified by the <i>field_name</i> element. This allows user-defined IMS QTI-specific meta-data to be associated with the evaluation objects. The content is defined as a free format string. In some cases it will be possible to use the vocabulary to define the limits to which the data must conform.
<b>generic_identifier</b>	The <i>generic_identifier</i> element is used to contain any type of identifier that is assigned to the object – an object or activity may have more than one such identifier. It consists of the type of identifier being defined (using the <i>type_label</i> element) and the actual identity string itself (using the <i>identifier_string</i> element).
<b>grade</b>	The <i>grade</i> element is used to contain the grade result information. Apart from the actual grade awarded and the associated cut-grade, this information consists of the variable name used to store the grade (the <i>varname</i> attribute), the set of possible grades that could have been awarded (the <i>members</i> attribute) and the status of the grade awarded (the <i>status</i> attribute).
<b>grade_cut</b>	The <i>grade_cut</i> element is used within the <i>grade</i> element to define the grade that if obtained or surpassed denotes that the material has been mastered. If the <i>members</i> attribute has been used on the <i>grade</i> element then the assigned <i>grade-cut</i> should be one value in that set.
<b>grade_value</b>	The <i>grade_value</i> element is used within the <i>grade</i> element to contain the grade awarded. If the <i>members</i> attribute has been used on the <i>grade</i> element then the value stored should be one value in that set.
<b>hint_switch</b>	The <i>hint_switch</i> attribute is used to report if hints were available through the evaluation object i.e. was Hint display enabled. The possible states are {Yes, No} with 'No' being the default. This switch is used within the <i>control</i> element within the <i>item_result</i> , <i>section_result</i> and <i>assessment_result</i> elements.
<b>ident_ref</b>	The <i>ident_ref</i> attribute is used to reference the unique identifier allocated to the object. The uniqueness of the identifier is not maintained by the XML and so a naming convention should be adopted e.g. the IMS Persistent Location Independent Resource Identifier. This identifier may have been allocated to the objects using the <i>ident</i> attribute within the IMS QTI ASI specifications.
<b>identifier_string</b>	This element is the container for the identification information assigned to an object. It is used as a part of the <i>generic_identifier</i> element. This is a string field of 1-256 characters length.

<b>item_result</b>	The <i>item_result</i> element is the container for all of the results information pertaining to a particular Item. This is the structure that should be used to contain the results reports from evaluation objects based upon the IMS QTI Item structure or proprietary Item/Question structures that have a similar usage. Each <i>item_result</i> is contained within a single <i>result</i> element and so reports for multiple Items must use multiple result instances.
<b>members</b>	The <i>members</i> attribute is used by the <i>grade</i> element to define the members of the set of possible grades being defined. The members are defined as a comma separated list without any enclosing parentheses and the list is order from left to right with the highest grade being the leftmost member of the set.
<b>name</b>	The <i>name</i> element is used within the <i>context</i> element to contain the name of the candidate undertaking the evaluation being reported. This formatted name can consist of 1-156 characters.
<b>num_attempts</b>	The <i>num_attempts</i> element is used to contain the number of attempts that were made to answer a particular response. An attempt is defined as the final answer that is given to a response for one visit to that response structure. Subsequent visits are counted as more attempts. How the actual visit is identified as being complete is assessment-engine dependent.
<b>num_items</b>	The <i>num_items</i> element is used to store the total number of Items associated with the host Assessment or Section. This number is a cumulative value across all of the Sections containing their own set of Items.
<b>num_items_attempted</b>	The <i>num_items_attempted</i> element is used to record the total number of Items within the object being reported that were attempted by the candidate. This number will be less than or equal to the value reported in the <i>num_items_presented</i> element. This number is the total number of Items attempted from all of the object hierarchy being reported.
<b>num_items_presented</b>	The <i>num_items_presented</i> element is used to record the total number of Items within the object being reported that were presented to the candidate. This number is the total number of Items presented from all of the object hierarchy being reported.
<b>num_sections</b>	The <i>num_sections</i> element is used to store the total number of Sections associated with the host Assessment or Section. This number is a reflection of the immediate children of the Assessment or Section i.e. it is not a cumulative score of the hierarchy up to the point being recorded.
<b>num_sections_presented</b>	The <i>num_sections_presented</i> element is used to record the total number of Sections within the object being reported that were presented to the candidate. This number is the total number of Sections presented that are immediate children of the object being recorded.
<b>objective</b>	This <i>objective</i> element is the container for the description of the objectives originally assigned to the Assessments, Sections and Items – the context is defined by the usage. These objectives are defined with respect to the actor as defined by the <i>view</i> attribute. Externally referenced objectives are linked using the <i>uri</i> or <i>entityref</i> attribute.
<b>outcomes</b>	The <i>outcomes</i> element is used to contain the actual scores and grades that are being reported within the <i>summary_result</i> , <i>assessment_result</i> , <i>section_result</i> and <i>item_result</i> elements. Multiple sets of scores and grades can be stored and the status of these results can also be stored.
<b>presented</b>	The <i>presented</i> attribute is used on the <i>section_result</i> and the <i>item_result</i> elements to indicate if the object has been presented to the participant. The possible values of the attribute are {Yes, No, Unknown} with ‘Yes’ being the default value.

<b>qti_comment</b>	This is the commenting facility within the XML schemas. The comments can take any form supported as #PCDATA. The key difference between this comment style and the standard ' <code>&lt;!-- *** --&gt;</code> ' is that the former is passed through the XML parser to the host system.
<b>qti_result_report</b>	The <i>qti_result_report</i> is the root element for the IMS QTI Results Report XML binding. It can contain either a <i>summary_result</i> , <i>assessment-result</i> , <i>section_result</i> or <i>item_result</i> report.
<b>render_type</b>	The <i>render_type</i> attribute is used on the <i>response_form</i> element to describe the nature of the rendering used on the response structure (an Item can be constructed from more than one response structure). The possible values of the attribute are {choice, hotspot, slider, fib, extension}. The 'choice', 'hotspot', 'slider' and 'fib' values reflect the corresponding ASI structures and 'extension' is used to denote any proprietary response extension structure.
<b>response</b>	The <i>response</i> element is within the <i>item_result</i> element to contain the description of the response structure of the Item, the number of attempts made at answering the question and the response that was actually submitted by the participant.
<b>response_form</b>	The <i>response_form</i> element is used within the <i>response</i> element to contain the actual description of the response structure for the associated Item. This description uses the <i>cardinality</i> , <i>render-type</i> , <i>timing</i> and <i>response_type</i> attributes. This structure also contains the <i>correct_response</i> element.
<b>response_status</b>	The <i>response_status</i> attribute is used on the <i>response_value</i> element to describe the nature of the value. The possible values of this attribute are: {Null, Valid, NA} and 'Invalid'. The default value is 'Valid'. This attribute is used to indicate the validity of the response supplied by the participant.
<b>response_time</b>	The <i>response_time</i> attribute is used with the <i>response_value</i> element to store the duration of a response i.e. the time between the initial entry into the Item and the submission of the answer by the participant. The value is in the range 0f 1-999 seconds.
<b>response_type</b>	The <i>response_type</i> attribute is used with the <i>response_form</i> element to define the type of response expected from the participant. The enumerated set of values assigned to the <i>response_type</i> are {lid, str, xy, num, grp, extension}. The values 'lid', 'xy', 'str', 'num' and 'grp' follow the corresponding ASI structure whereas 'extension' is used for proprietary response types.
<b>response_value</b>	The <i>response_value</i> element is used within the <i>response</i> element to contain the actual responses supplied by the participant. The associated attributes are the <i>response_status</i> , <i>response_time</i> , <i>uri</i> and <i>entityref</i> . The multiplicity and order of the <i>response_value</i> elements reflects the number of, and the sequence of, the responses given by the participant. The actual data stored will be either the label of the response (for <i>response_lid</i> structures), the xy-coordinate of the point identified (for <i>response_xy</i> structures) or the actual data input e.g. string, number, etc.
<b>result</b>	The <i>result</i> element is the container for the reported results. There can be multiple instances of <i>result</i> within the <i>qti_result_report</i> root element but each <i>result</i> element can contain the results of either one summary, one Assessment, one Section or one Item. Each result also contains the context for the instantiation of the evaluation.
<b>score</b>	The <i>score</i> element is used to contain all of the reported information about a single scoring variable. It is used within the <i>outcomes</i> and <i>summary_result</i> elements. The name and type of the score variable are defined using the attributes <i>varname</i> and <i>vartype</i> respectively with default values of 'SCORE' and 'integer'.
<b>score_average</b>	The <i>score_average</i> element is used within the <i>score</i> element to contain the average value that would be expected for this evaluation event. This is a reported value and is not derived from the scoring engine itself. The data type will follow the type of the scoring variable.



<b>score_cut</b>	The <i>score_cut</i> element is used within the <i>score</i> element to define the cut score for the evaluation event. Any score equal to or above this value is used to denote mastery of the associated learning materials. The data type will follow the type of the scoring variable.
<b>score_interpretation</b>	The <i>score_interpretation</i> element is used within the <i>score</i> element to contain the information that can be used to provide the mathematical interpretation of the results. The actual interpretation is supplied as either a string (1-2048 characters) or as a reference to an external file using the <i>uri</i> or <i>entityref</i> attributes.
<b>score_max</b>	The <i>score_max</i> element is used to contain the maximum score that could have been assigned to the scoring variable. The type of the information is as per the <i>vartype</i> attribute defined on the score element. This is used within the <i>score</i> element and is normally accompanied by the <i>score_min</i> element.
<b>score_min</b>	The <i>score_min</i> element is used to contain the minimum score that could have been assigned to the scoring variable. The type of the information is as per the <i>vartype</i> attribute defined on the score element. This is used within the <i>score</i> element and is normally accompanied by the <i>score_max</i> element.
<b>score_normalized</b>	The <i>score_normalized</i> element is used within the <i>score</i> element to contain the normalized value of the score being reported. The score is normalized to lay within the range 0-1. The normalization is defined using the <i>*.max</i> and <i>*.min</i> values and so it can only be supplied if the minimum and maximum values for the variable have been defined when declared.
<b>score_reliability</b>	The <i>score_reliability</i> element is used within the <i>score</i> element to contain the reliability metric that describes the score. This value is not calculated from the scoring mechanism but is a reported value. The value is reported as a real number and must consist of no more than 32 characters.
<b>score_std_error</b>	The <i>score_std_error</i> element is used within the <i>score</i> element to contain the standard error value that would be expected for this evaluation event. This is a reported value and is not derived from the scoring engine itself. The data type will follow the type of the scoring variable. The value is reported as a real number and must consist of no more than 32 characters.
<b>score_value</b>	The <i>score_value</i> element is used within the <i>score</i> element to contain the score awarded. There is only one score value assigned to each score variable.
<b>section_result</b>	The <i>section_result</i> element is the container for all of the results information pertaining to a particular Section. This is the structure that should be used to contain the results reports from evaluation objects based upon the IMS QTI Section structure or proprietary Section/Topic structures that have a similar usage. Each <i>section_result</i> is contained within a single <i>result</i> element and so reports for multiple Sections must use multiple result instances.
<b>solution_switch</b>	The <i>solution_switch</i> attribute is used to report if solutions were available through the evaluation object i.e. was Solution display enabled. The possible states are {Yes, No} with 'No' being the default. This switch is used within the <i>control</i> element within the <i>item_result</i> , <i>section_result</i> and <i>assessment_result</i> elements.
<b>source</b>	The <i>source</i> attribute is optionally available to the <i>type_label</i> element to define the source of the associated vocabulary. This source is normally a URL string (1-256 characters).
<b>status</b>	The enumerated <i>status</i> attribute is optionally available to the <i>score</i> and <i>grade</i> elements. The possible values of this attribute are {Valid, Noanswer, Error}. 'Valid' is the default value and is used to indicate that a score has been reported, 'Noanswer' means that no attempt was made to answer the question (for whatever reason) and 'Error' is used to indicate the assessment failure status.



<b>status</b>	The <i>status</i> element is used within the <i>summary_result</i> and <i>outcomes</i> elements to indicate the status of the contained information. The status may consist of the type of status being reported (using the <i>type_label</i> element), the date that the status is being recorded (using the <i>datetime</i> element) and the actual status value (using the <i>status_value</i> element).
<b>status_value</b>	The <i>status_value</i> element is used within the <i>status</i> element to contain the status being recorded. This information is a string (1-32 characters). At the current time there is no vocabulary for the status.
<b>summary_result</b>	The <i>summary_result</i> element is the container for all of the results information pertaining to a summary of an evaluation. A summary may be of an Assessment, Section, Item or any other appropriate evaluation activity. Each <i>summary_result</i> is contained within a single <i>result</i> element and so reports for multiple summaries must use multiple result instances.
<b>timing</b>	This attribute is used on the <i>response_form</i> element to indicate if the response is time-dependent. The possible entries are {Yes, No} with the default value being assumed as 'No' i.e. there is no recording of the time taken to enter an answer.
<b>type_label</b>	The <i>type_label</i> element is used whenever a data structure requires typing i.e. a date, status, generic identifier or summary result. The content for the element is the actual type and is a string (1-64 characters). The content may be defined with respect to a vocabulary using the source attribute. If a vocabulary is used then the content of the <i>type_label</i> should be contained within the vocabulary.
<b>uri</b>	The <i>uri</i> attribute is used to identify an external resource i.e. typically a file name or URL. In some cases, an alternative, and preferred method is the usage of the <i>entityref</i> attribute. This should be used when the named resource needs to be bound and exchanged with the results instance XML file.
<b>varname</b>	The <i>varname</i> attribute is used to define the name of the variable. This attribute is used by the <i>score</i> and <i>grade</i> elements. The name can consist of any lowercase and uppercase characters i.e. a-z, A-Z, 0-9 and underscore (0-9 should not be used for the first character). The default variable name is 'SCORE'.
<b>vartype</b>	The <i>vartype</i> attribute is used by the <i>score</i> element to define the type of variable being declared. The type of variable is: String, Boolean, Integer, Decimal, Scientific, Set and Enumerated. The 'Set' and 'Enumerated' option enable the declaration of typed entries and the range of types is defined within the <i>members</i> attribute that must accompany the declaration.
<b>view</b>	The <i>view</i> attribute is used to define the 'actors' permitted to see the associated information e.g. feedback, objectives, etc. The supported actors are All (used to indicate access to all), Administering Authority, Administrator, Assessor, Author, Candidate, Invigilator/Proctor, Psychometrician, Scorer and Tutor.
<b>vocabulary</b>	The <i>vocabulary</i> element is used to provide the vocabularies to be used for the IMS QTI-specific meta-data, as entered through the <i>asi_metadata</i> element. The <i>uri</i> and <i>entityref</i> attributes are used to define any external file that contains the actual vocabulary.
<b>vocab_type</b>	The <i>vocab_type</i> attribute is used with the <i>vocabulary</i> element to describe the type of vocabulary file that is referred to in the associated <i>uri</i> or <i>entityref</i> attributes. The default type of file type is 'text/plain'.
<b>xml:lang</b>	The <i>xml:lang</i> attribute is used wherever the language of the entry text can be varied. This attribute is used to define the language of the associated text. The format of the attribute shows that it is one of the core attributes provided by XML itself.

# Appendix C – Examples Information

## C1 – Proposed Naming Convention

A request has been made to introduce a naming convention for the IMS QTI example files that is more informative. The request is for the name to reflect the nature of the content of the file.

### C1.1 – Directory Naming

The directory naming convention is proposed to be (the bold words are the corresponding directory names):

#### **ims\_qtiresv1p2examples**

**item** – Item(s) result examples

**section** – Section(s) result examples

**assessment** – Assessment(s) result examples

**summary** – Summary result examples

**mixed** – instances that contain a mixture of Summary, Item, Section and Assessment examples

## About This Document

Title	IMS Question & Test Interoperability Results Reporting Best Practice & Implementation Guide
Editors	Colin Smythe, Lane Brewer, and Steve Lay
Version	1.2
Version Date	11 February 2002
Status	<b>Final Specification</b>
Summary	This document presents the IMS QTI Results Reporting Best Practice & Implementation Guide. It complements the IMS Question & Test Interoperability: Results Reporting XML Binding and Information Model documents.
Revision Information	22 January 2002
Purpose	Defines the ways in which the QTI XML binding is used to implement interoperability between assessment-oriented systems.
Document Location	<a href="http://www.imsglobal.org/question/v1p2/imsqti_res_bestv1p2.html">http://www.imsglobal.org/question/v1p2/imsqti_res_bestv1p2.html</a>

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## Revision History

Version No.	Release Date	Comments
Base Document Version 1.2	7 June 2001	The first formal release of the IMS QTI: Results Reporting Best Practice & Implementation Guide Base Document.
Public Draft Version 1.2	30 September 2001	The first public release of the IMS QTI: Results Reporting Best Practice & Implementation Guide document.
Final Version 1.2	11 February 2002	The first final release of the IMS QTI: Results Reporting Best Practice & Implementation Guide document.

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