



# **IMS Question & Test Interoperability XML Binding Specification**

**Final Specification  
Version 1.0**

## About This Document

Title	IMS Question & Test Interoperability XML Binding Specification
Authors	Colin Smythe and Eric Shepherd
Version	Version 1.0
Version Date	5 <sup>th</sup> June, 2000
Status	<b>Final Specification.</b>
Summary	This document describes the Question & Test Interoperability XML binding for the corresponding information model. The XML encoding is based on the W3C XML specification version 1.0. A mixture of attribute and tagged forms is used.
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Purpose	Defines how the Question & Test Interoperability Information Model is encoded in XML by IMS.
Document Location	<a href="http://www.imsproject.org/question/qtbind01.html">http://www.imsproject.org/question/qtbind01.html</a>

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## Revision History

Version No.	Release Date	Comments
Base 1.0	22 <sup>nd</sup> December, 1999	The first release of the IMS Question & Test Interoperability XML Binding Base Document.
Public Draft 1.0	18 <sup>th</sup> February, 2000	The first public draft release of the IMS Question & Test Interoperability XML Binding Specification.
Final 1.0	5 <sup>th</sup> June, 2000	<p>The version 1.0 of the IMS Question &amp; Test Interoperability XML Binding Final Specification.</p> <p>The amendments from the Public Draft release are:</p> <ul style="list-style-type: none"> <li>• The meta-data elements have been added to each of the <i>assessmentmetada</i>, <i>sectionmetadata</i> and <i>itemmetadata</i> elements;</li> <li>• The <i>showdraw</i> attribute has been added to the <i>render_hotspot</i> element;</li> <li>• The <i>objectives</i> element has been added to relce the <i>assessobjectives</i>, <i>sectionobjectives</i> and <i>itemobjectives</i> elements;</li> <li>• The <i>varcontains</i> element has been renamed <i>varsubset</i>;</li> <li>• The <i>setmatch</i> attribute has been added to the <i>varsubset</i> element to control set testing.</li> </ul>

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# 1. Introduction

## 1.1 Overview

The IMS Question & Test Interoperability XML Binding describes the Document Type Definition (DTD) and XML Data Representation (XDR) that are used to provide interoperability between question and test systems, particularly those for distributed learning. The key interoperable data structures are those of:

- Assessment – the basic test unit;
- Section – a container for groups of sections and items which support a common objective;
- Item – the fundamental self-contained question/response block within which the individual questions are contained.

Version 1.0 of the eXtensible Markup Language (XML) specification of the World Wide Web Consortium (W3C) is used. A DTD and XDR have been defined that are capable of representing the Assessment, Section and Item objects in any appropriate combination.

## 1.2 Scope & Context

This document is the IMS Question & Test Interoperability (Q&TI) XML Binding Specification. As such it will be used as the basis for the production of the following documents:

- IMS Question & Test Interoperability XML DTD;
- IMS Question & Test Interoperability XML XDR;
- IMS Question & Test Best Practice & Implementation Guideline document.

This binding has been derived from the agreed IMS Q&TI Information Model Specification [QTI, 00a] and conforms to the XML Version 1.0 specification [XML, 98] of the W3C.

## 1.3 Structure of this Document

The structure of this document is:

2. XML BASICS	A brief description of the components within an XML schema;
3. DOCUMENT TYPE DEFINITION	The DTD used to describe the <i>Assessment</i> , <i>Section</i> and <i>Items</i> and defined as the IMS_QTI01.dtd;
4. EXAMPLE XML SCHEMA	Examples of the XML schema for <i>Assessments</i> , <i>Sections</i> and <i>Items</i> ;
5. META-DATA	The meta-data used to describe <i>Assessments</i> , <i>Sections</i> and <i>Items</i> .
APPENDIX A - DTD	A copy of the uncommented DTD;
APPENDIX B - XDR	A copy of the uncommented XDR;

## 1.4 Nomenclature

CDATA	Character Data
DTD	Document Type Definition
PCDATA	Parsed Character Data
Q&TI	Question & Test Interoperability
W3C	World Wide Web Consortium
XDR	XML Data Representation
XHTML	XML HyperText Mark-up Language

XML                    Extensible Markup Language

## 1.5 References

- [QTI, 00a]        *IMS Question & Test Interoperability Information Model Base Document*, C.Smythe, Version 1.0, IMS, May 2000.
- [QTI, 00b]        *IMS Question & Test Interoperability Best Practice & Implementation Guide Base Document*, C.Smythe, Version 1.0, IMS, May 2000.
- [XML, 98]        *XML Version 1.0 Specification of the W3C*, <http://www.w3.org/TR/1998/REC-xml-19980210>, World Wide Web Consortium, 1998.

## 2. XML Basics

The Question & Test Interoperability data model can be defined as a hierarchy. Hierarchical models are convenient for representing data consisting of many elements and sub-elements. XML is perfectly suited for representing hierarchical models. An XML document is a hierarchy comprised of **elements** that have **contents** and **attributes**.

### 2.1 Elements

An element is a component of a document that has been identified in a way a computer can understand. Each element has a **tag name**. When a tag name is shown as “<TAGNAME>”, with less-than and greater-than symbols before and after the tag name, it serves as the **start-tag** to mark the beginning of an element. When that same tag name has a forward slash “/” added, it serves as an **end-tag** such as “</TAGNAME>”. An element may have contents between its start and end-tags and may have one or more **attributes**. When an XML element has a start and end-tag (also called an **opening** and **closing tag**) with a common name, it is considered to be “well-formed” XML. The contents of an element are placed between the start and end-tags as shown below:

```
<TAGNAME>contents</TAGNAME>
```

#### 2.1.1 Element Contents

An element may contain other elements, Parsed Character Data (PCDATA), Character Data (CDATA), or a mixture of PCDATA and elements. The allowable contents of an element are its **content model**. PCDATA really means any character string that does not contain elements. PCDATA is what the bulk of elements will use between their start and end-tags. CDATA is different in that it is a method for adding any character data that should not be processed. For example, you could add some Java script code instructions using a CDATA section. A CDATA section tells the parser not to look for any markup until after it locates the end of the CDATA section.

#### 2.1.2 Element Attributes

An attribute provides additional information about an element. Attributes are a way of attaching characteristics or properties to the elements of a document. An element may have more than one attribute and they are contained within the start tag of an element. Attributes are represented by an attribute name followed by an equal sign and the attribute value in quotation marks:

```
<timeframe>
  <begin restrict="1"> 1999-07-23 </begin>
</timeframe>
```

In this example the <timeframe> element contains another element, the <begin> element. The <begin> element has one attribute “restrict”, with the value 1. The value for the element <begin> is “1999-07-23”. These two elements then make up a ‘timeframe begin’ date.

#### 2.1.3 Element Names

Each element has a unique name, referred to as the tag name. XML is case-sensitive in its processing of tag names. The IMS Question & Test Interoperability XML Binding Specification adheres to the following tag name rules:

- All tag names will conform to the rules for element naming as given within the XML Version 1.0 specification;
- Names beginning in “xml” in any case or mix of cases are not permitted;
- All element and attribute names in the IMS XML binding are aligned with the W3C XHTML standard and as such will be **lower-case**;
- Element names may not include words reserved by the XML specification. These include:

```
DOCTYPE
ELEMENT
ATTLIST
ENTITY
```

- Tag names defined within the IMS Q&TI XML Binding may not be redefined, with the exception of those that are used for extensions.

## 2.2 Document Type Definitions (DTD)

The *tag name*, *content model*, and *attributes* of elements are defined in a **Document Type Definition** (DTD) statement. These may exist as an external file or a block of text internal to an XML document. Internal DTDs are used to override elements defined in external DTD files, so an internal DTD should be used with care. The DTD defines the elements that may be used, and may define the contents of the elements.

This specification defines the **external DTD** with the file name (for version 1.0):

### IMS\_QTIv1p0.dtd

Some XML editors may make use of a DTD to help guide the developer in creating the proper elements at the proper locations in an XML file. Other developers will make use of the DTDs to validate their XML documents to ensure their document is consistent with all of the element names and locations defined in the DTD. An XML document is **valid** if it has an associated document type declaration and if the document complies with the constraints expressed in it. Details of the construction of DTDs are outside the scope of this document, but links to the [XML Version 1.0](#) specification are included in the References section of this document.

#### 2.2.1 Declaring Element Contents

The information specifying the order and usage of allowable contents for an element are its **content model**. The content model is declared in a DTD (see below). The declaration of the content model is of the general form:

```
<!ELEMENT tagname (Content Model)>
```

The SHORT element can again serve as an example of how an element is declared with its content model:

```
<!ELEMENT short (#PCDATA)>
```

This element will contain character data (#PCDATA) that can be processed. The [XML Specification](#) provides more information about the details for creating and interpreting content models.

#### 2.2.2 Declaring Element Attributes

An example of how the attributes for the element **assessment** is declared in a DTD is found below:

```
<!ELEMENT assessment (description, section+, objectives?, result,
extension?)>
```

```
<!ATTLIST assessment title CDATA #IMPLIED>
```

The first line declares that there is an element named **assessment** that must have the **description**, **section** and **result** elements and is additionally allowed to have **objectives** and/or **extension** elements as its contents. The second line begins with “!ATTLIST” to start an attribute list declaration for the **assessment** element. The word **title** will serve as the attribute’s name. The allowable value for this attribute must be of type CDATA.

At the end of the example above is the term IMPLIED. It is at this location in the attribute declaration, where a default value for an attribute may be specified. It is also possible to use the keyword REQUIRED which would force a TYPE value to be supplied and there would be no default value. In the example above, the IMPLIED designation means that the designer wants to allow users to omit the value for the attribute without forcing a particular default value.

#### 2.2.3 Use of Attributes

Within the IMS XML binding, the use of attributes is reserved for information about the structure of the relevant data object. This means that an attribute is used to create a specific type of element e.g. the element could be the date and its attribute could be used to define the date as the date of birth.



## Lists

A list is a repetition of the contents of an element. In XML, this is accomplished by repeating the containing element: for example, the **section** element contains an element **item**. Described in the DTD as:

```
<!ELEMENT section (item*, extension?)>
```

When instantiated in XML a repeating list of ITEM elements would appear:

```
<section>
  <item> "The first question set."</item>
  <item> "The second question set."</item>
</section>
```

In this example, the element **item** is repeated. Thus **item** is the *containing* element for *the repeated contents* descriptions. The notation for repetitions of an element in a content model follows the XML specification. An asterisk (\*) specifies that *none or more* repetitions of the element may be included in the XML instantiation whereas a plus (+) specifies that *one or more* repetitions of the element may be included in the XML instantiation.

## 2.3 XML Schemas

A schema is a formal specification of element names that indicates which elements are allowed in an XML document, and in which combinations. New schema languages, such as those defined in the XML-Schemas Working Group, provide the same baseline functionality as a DTD. However, because these schema languages are extensible, developers can augment them with additional information, such as data types, inheritance and presentation rules. This makes these new schema languages far more powerful than DTDs. For more information about XML schemas, go to <http://www.w3.org/XML/Group/Schemas.html>.

This specification defines the **external XDR** with the file name (for version 1.0):

**IMS\_QTIv1p0.xdr**

This specification defines an XMLData Representation (XDR). Some XML editors may make use of such a schema to help guide the developer in creating the proper elements at the proper locations in an XML file. Other developers will make use of the schema to validate their XML documents and/or to define extensions to the IMS Q&TI specification. Details of the construction of XDRs are outside the scope of this document.

## 2.4 Special Handling Requirements

### 2.4.1 XML Reserved Characters

Some characters used in XML must be escaped when used outside of their XML defined usage as found in Section 2.4 of the XML 1.0 Specification. These characters are ampersand (&), less than (<), greater than (>), apostrophe(') and the double-quotes character(""). These characters may be represented using either numeric character references or the strings "&amp;", "&lt;", "&gt;", "&apos;", and "&quot;". Below is a more complete quote from the W3C XML specification:

Quote from Extensible Markup Language (XML) 1.0  
W3C Recommendation 10-February-1998  
2.4 Character Data and Markup

*Text consists of intermingled character data and markup. Markup takes the form of start-tags, end-tags, empty-element tags, entity references, character references, comments, CDATA section delimiters, document type declarations, and processing instructions.*

*All text that is not markup constitutes the character data of the document.*

*The ampersand character (&) and the left angle bracket(<) may appear in their literal form only when used as markup delimiters or within a comment, a processing instruction or a CDATA section. They are also legal within the literal entity value of an internal entity declaration; see "4.3.2 Well-Formed Parsed Entities". If they are needed elsewhere, they must be escaped using either numeric character references or the strings "&amp;" and "&lt;".*

respectively. The right angle bracket (>) may be represented using the string “&gt;” and must, for compatibility, be escaped using “&gt;” or a character reference when it appears in the string “]]>” in content, when that string is not marking the end of a CDATA section.

In the content of elements, character data is any string of characters which does not contain the start delimiter of any markup. In a CDATA section, character data is any string of characters not including the CDATA-section-close delimiter, “]]>”.

To allow attribute values to contain both single and double quotes, the apostrophe or single-quote character (') may be represented as “&apos;”, and the double-quote character (") as “&quot;”.

#### 2.4.2 White Space Handling

Questions arise as to whether web-based data transmission tools might inadvertently strip-off or transform some of the white space characters embedded in the Enterprise data transmitted between systems using XML. To eliminate concern about this issue, refer to the following quote from the W3C XML standards, which indicate that all white space must be preserved where it is part of the data.

Quote from Extensible Markup Language (XML) 1.0  
W3C Recommendation 10-February-1998  
2.10 White Space Handling

*In editing XML documents, it is often convenient to use “white space” (spaces, tabs, and blank lines, denoted by the non-terminal S in this specification) to set apart the markup for greater readability. Such white space is typically not intended for inclusion in the delivered version of the document. On the other hand, “significant” white space that should be preserved in the delivered version is common, for example in poetry and source code.*

*An XML processor must always pass all characters in a document that are not markup through to the application. A validating XML processor must also inform the application which of these characters constitute white space appearing in element content.*

*A special attribute named xml:space may be attached to an element to signal an intention that in that element, white space should be preserved by applications. In valid documents, this attribute, like any other, must be declared if it is used. When declared, it must be given as an enumerated type whose only possible values are “default” and “preserve”. For example:*

```
<!ATTLIST poem xml:space (default | preserve)'preserve'>
```

The value “default” signals that applications’ default white-space processing modes are acceptable for this element; the value “preserve” indicates the intent that applications preserve all the white space. This declared intent is considered to apply to all elements within the content of the element where it is specified, unless overridden with another instance of the xml:space attribute.

## 2.5 Extensibility

Some providers will find the current element set defined in the Question & Test Interoperability specification too restrictive to accomplish their purposes. To ensure extensibility, the specification requires that there be no limit on potential extensions on major elements. An extension is the addition of information to an existing XML structure.

```
<!ELEMENT resp_extension ANY>
```

An example of the inclusion of **resp\_extension** in the content model of element **presentation** is:

```
<!ELEMENT presentation (render_choice, render_hotspot, resp_extension?)>
```

The use of the **resp\_extension** element is illustrated as follows:

```

<presentation>
  <render_choice> ... Multiple choice selections ... </render_choice>
  <render_hotspot> ... Image hot spot selections ... </render_hotspot>
  <resp_extension>
    <qticomment>This is a test to demo extensions</qticomment>
  </resp_extension>
</presentation>

```

The contents, but not a content model, of an extension must be declared in an internal or external DTD. Many extensions can be created through the use of existing elements. Care must be used with internal DTDs, as they override external DTD declarations. The content of an extension must obey the attribute and content models of the elements employed. New elements that duplicate the definitions of existing elements should not be introduced.

Prefacing the **resp\_extension** element with an appropriate namespace may reference descriptions of extensions. For example, a group such as the Advanced Distributed Learning (ADL) initiative may wish to add the “adl” prefix to an extension element to uniquely identify ADL extensions. The following is an example of this:

```

<item>
  ... mandatory elements of item elements here ...
  <description lang= " en " >
    <short>Military psychometric question </short>
  </description>
  <extension adl:classification="Not classified"
    adl:title="Psychometric question">This example discusses how
    the psychometric questions are constructed for defence
    posts.
  </extension>
</item>

```

This serves to note the entire extension structure. Extensions should always be added at the lowest point (farthest from the root element) in the hierarchy possible, to the degree that the structure defines the meaning of the extension.

### 3. Document Type Definition

```

<!-- ***** -->
<!-- -->
<!-- TITLE:          IMS_QTIv1p0.dtd -->
<!-- DESCRIPTION:    IMS Question and Test Interoperability -->
<!-- -->
<!-- -->
<!-- REVISION HISTORY: -->
<!-- Date           Author           Comments -->
<!-- ===== -->
<!-- 5 June 2000    Colin Smythe     Final release of the -->
<!-- -->
<!-- -->
<!-- -->
<!-- -->
<!-- -->
<!-- -->
<!-- -->
<!-- DTD Structure -->
<!-- ===== -->
<!-- -->
<!-- The elements of this document have been organised to follow -->
<!-- a similar structure to that found in the Q&TI Information -->
<!-- Model. -->
<!-- -->
<!-- Comments for the element will proceed the element in the -->
<!-- following format: -->
<!-- -->
<!-- Explanation: -->
<!--     Text for explanation. -->
<!-- Type -->
<!--     Text for the typing. -->
<!-- Notes -->
<!--     Text for notes. -->
<!-- -->
<!-- +-----+ -->
<!-- -->
<!-- Please use the following as the index to follow this DTD. -->
<!-- -->
<!-- Document Root (i.e. QUESTESTINTEROP) -->
<!-- Entities -->
<!-- Elements common to all the major roots -->
<!-- -->
<!-- Main Objects and their elements will follow -->
<!-- -->
<!-- ASSESSMENT root -->
<!--     Assessment elements. -->
<!-- SECTION root -->
<!--     Section elements. -->
<!-- ITEM ROOT -->
<!--     Item elements. -->
<!-- -->
<!-- ***** -->

```

```
<!-- ***** -->
<!-- ***** -->
<!--      ### This is the Root element. ### -->
<!-- -->
<!ELEMENT questestinterop (qticomment? , (assessment | section | item )+ )>

<!-- ##### -->
<!-- ***** -->
<!-- ***** -->

<!-- ***** -->
<!-- ***** -->
<!-- -->
<!-- ENTITIES -->
<!-- -->
<!-- The entities are: -->
<!-- -->
<!-- 1. Title - the title of an object. -->
<!-- 2. Label - element labelling. -->
<!-- 3. Ident - the required unique element identifier. -->
<!-- 4. View - the view mode. -->
<!-- 5. FeedbackSwitch - setting mode for feedback. -->
<!-- 6. HintsSwitch - setting mode for hints. -->
<!-- 7. SolutionsSwitch - setting mode for solutions. -->
<!-- 8. Rcardinality - the class of number of user responses. -->
<!-- 9. Rtiming - the provision for duration information. -->
<!-- 10. Uri - Universal Resource Indicator. -->
<!-- 11. X0 - top left-hand x-coordinate. -->
<!-- 12. Height - the length of the y-axis size. -->
<!-- 13. Y0 - top left-hand Y-coordinate. -->
<!-- 14. Width - the length of the x-axis size. -->
<!-- 15. Embedded - embedding of information in the file. -->
<!-- 16. CharSet - the supported character set. -->
<!-- 17. LinkRefId - link reference to a declared identifier. -->
<!-- 18. VarName - variable name to be used (required). -->
<!-- 19. RespIdent - Response-type reference identity. -->
<!-- 20. Continue - Continuation of processing. -->
<!-- 21. ScoreModel - Scoring model to be used. -->
<!-- 22. MinNumber- the minimum number of expected responses. -->
<!-- 23. MaxNumber - the max number of expected responses. -->
<!-- 24. FeedbackStyle - the types of solution/hint feedback. -->
<!-- 25. Case - case sensitive comparisons indicator. -->
<!-- -->
<!-- ***** -->
<!-- ***** -->
```

```

<!-- ++++++ -->
<!-- The title for the related object. Normally upto 256 -->
<!-- characters long. -->
<!-- ++++++ -->
<!ENTITY % I_Title " title CDATA #IMPLIED">

<!-- ++++++ -->
<!-- The label used to support search and editing. It is also -->
<!-- used as the optional identifier. -->
<!-- ++++++ -->
<!ENTITY % I_Label " label CDATA #IMPLIED">

<!-- ++++++ -->
<!-- The unique identifier for the element. This declaration is -->
<!-- used when the ident is required. -->
<!-- ++++++ -->
<!ENTITY % I_Ident " ident CDATA #REQUIRED">

<!-- ++++++ -->
<!-- The actors who require a view of the data. -->
<!-- ++++++ -->
<!ENTITY % I_View " view (All |
                        Administrator |
                        AdminAuthority |
                        Assessor |
                        Author |
                        Candidate |
                        InvigilatorProctor |
                        Psychometrician |
                        Scorer |
                        Tutor ) 'All' ">

<!-- ++++++ -->
<!-- The permitted display of feedback. -->
<!-- ++++++ -->
<!ENTITY % I_FeedbackSwitch " feedbackswitch (Yes | No ) 'Yes' ">

<!-- ++++++ -->
<!-- The permitted display of hints. -->
<!-- ++++++ -->
<!ENTITY % I_HintSwitch " hintswitch (Yes | No ) 'Yes' ">

<!-- ++++++ -->
<!-- The permitted display of solutions. -->
<!-- ++++++ -->
<!ENTITY % I_SolutionSwitch " solutionswitch (Yes | No ) 'Yes' ">

<!-- ++++++ -->
<!-- The classification of the number of responses. -->
<!-- ++++++ -->
<!ENTITY % I_Rcardinality " rcardinality (Single | Multiple | Ordered )
                        'Single' ">

<!-- ++++++ -->
<!-- To enable time based response measurement. -->
<!-- ++++++ -->
<!ENTITY % I_Rtiming " rtiming (Yes | No ) 'No' ">

```

```

<!-- ++++++ -->
<!-- Universal Resource Locator. -->
<!-- ++++++ -->
<!ENTITY % I Uri " uri CDATA #IMPLIED">

<!-- ++++++ -->
<!-- Top left-hand X-coordinate. -->
<!-- ++++++ -->
<!ENTITY % I_X0 " x0 CDATA #IMPLIED">

<!-- ++++++ -->
<!-- Top left-hand Y-coordinate. -->
<!-- ++++++ -->
<!ENTITY % I_Y0 " y0 CDATA #IMPLIED">

<!-- ++++++ -->
<!-- The length of the y-axis size. -->
<!-- ++++++ -->
<!ENTITY % I_Height " height CDATA #IMPLIED">

<!-- ++++++ -->
<!-- The length of the x-axis size. -->
<!-- ++++++ -->
<!ENTITY % I_Width " width CDATA #IMPLIED">

<!-- ++++++ -->
<!-- The coding for the embedded data. -->
<!-- ++++++ -->
<!ENTITY % I_Embedded " embedded CDATA 'base64' ">

<!-- ++++++ -->
<!-- The identifier to which this link is referenced. -->
<!-- ++++++ -->
<!ENTITY % I_LinkRefId " linkrefid CDATA #REQUIRED">

<!-- ++++++ -->
<!-- The variable name to be used (required). -->
<!-- ++++++ -->
<!ENTITY % I_VarName " varname CDATA 'SCORE' ">

<!-- ++++++ -->
<!-- The response identifier to which the comparison refers. -->
<!-- ++++++ -->
<!ENTITY % I_RespIdent " respident CDATA #REQUIRED">

<!-- ++++++ -->
<!-- The instruction for continued score processing. -->
<!-- ++++++ -->
<!ENTITY % I_Continue " continue (Yes | No ) 'No' ">

<!-- ++++++ -->
<!-- The character sets repertoires supported. -->
<!-- ++++++ -->
<!ENTITY % I_CharSet " charset CDATA 'ascii-us' ">

```

```
<!-- ++++++ -->
<!-- The scoring model to be supported. 'SumofScores' is the -->
<!-- default scoring algorithm. -->
<!-- ++++++ -->
<!ENTITY % I_ScoreModel " scoremodel CDATA 'SumofScores' ">

<!-- ++++++ -->
<!-- The minimum number of expected responses from the user. -->
<!-- ++++++ -->
<!ENTITY % I_MinNumber " minnumber CDATA #IMPLIED ">

<!-- ++++++ -->
<!-- The maximum number of expected responses from the user. -->
<!-- ++++++ -->
<!ENTITY % I_MaxNumber " maxnumber CDATA #IMPLIED ">

<!-- ++++++ -->
<!-- The type of feedback styles for hints and solutions. -->
<!-- ++++++ -->
<!ENTITY % I_FeedbackStyle " feedbackstyle (Complete | Incremental |
Multilevel | Proprietary ) 'Complete' ">

<!-- ++++++ -->
<!-- The type of feedback styles for hints and solutions. -->
<!-- ++++++ -->
<!ENTITY % I_Case " case (Yes | No ) 'No' ">
```



```

<!-- ***** -->
<!-- ***** -->
<!-- -->
<!-- The QTI specific META-DATA used bythe Assessments, Sections -->
<!-- and Items. -->
<!-- -->
<!-- The Meta-data elements are: -->
<!-- -->
<!-- 1. qmd_absolute score - absolute scoring supported. -->
<!-- 2. qmd_assessment type - type of the Assessment. -->
<!-- 3. qmd_computer scored - automated Item scoring possible. -->
<!-- 4. qmd_feedback available - provision of feedback. -->
<!-- 5. qmd_hints available - provision of hints. -->
<!-- 6. qmd_item type - the type of Item e.g. multiple-choice. -->
<!-- 7. qmd_maximum score - the maximum Item score possible. -->
<!-- 8. qmd_number of items - the number of Items contained. -->
<!-- 9. qmd_rendering type - type of render used in the Item. -->
<!-- 10. qmd_response type - type of Item response expected. -->
<!-- 11. qmd_scoring available - scoring support of the Item. -->
<!-- 12. qmd_score type - the type of Assessment scoring used. -->
<!-- 13. qmd_sections included - inc. of Sections in the Section.-->
<!-- 14. qmd_solutions available - provision of solutions. -->
<!-- 15. qmd_selection selection - provision of Section selection.-->
<!-- 16. qmd_section sequence - provision of Section sequencing.-->
<!-- 17. qmd_item selection - provision of Item selection. -->
<!-- 18. qmd_item sequence - provision of Item sequencing. -->
<!-- 19. qmd_status - development status of the Item. -->
<!-- 20. qmd_time dependence - timing of the Item response. -->
<!-- 21. qmd_time limit - max time for completion of the A/S/I. -->
<!-- 22. qmd_tool vendor - vendor tool of source Assessment. -->
<!-- 23. qmd_topic - topic covered by the Item. -->
<!-- 24. qmd_material - types of content used. -->
<!-- 25. qmd_type of solution - type of solutions available. -->
<!-- 26. qmd_level of difficulty - education application level. -->
<!-- 27. qmd_weighting - weighting of the Item. -->
<!-- -->
<!-- ***** -->
<!-- ***** -->

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Range of scoring for the Assessment. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The range of scores that the user may attain i.e. -->
<!--     max score and min score. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_absolutescore (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The role of the Assessment. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options are: "Examination", "Survey", "Tutorial", -->
<!--     "Self-assessment", "Proprietary". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_assessmenttype (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Whether or not the Item can be scored by computer. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_computerscored (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Whether or not feedback is available. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_feedbackavailable (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Whether or not hints are available. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_hintsavailable (#PCDATA )>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The type of Item used. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options are: "Logical Identifier", "XY-coordinate", -->
<!--     "String", "Numerical" and "Logical Group". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_itemtype  (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The maximum score possible from that Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     An integer or real number. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_maximumscore  (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The number of Items contained by the object. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     An integer number. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_numberofitems  (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The type of rendering used within the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options are: "Choice", "Hotspot", "Slider", -->
<!--     "String", and "Proprietary". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_renderingtype  (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The class of response expected for the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options are: "Single", "Multiple" or "Ordered". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_responsetype  (#PCDATA )>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Whether or not scroing is used. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_scoringavailable (#PCDATA )>

<!-->
<!-->
<!-- ++++++ -->
<!-- Explanation: -->
<!-- The type of scoring used. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The options are: "Absolute", "Percentage", "Unscored" -->
<!-- and "Multidimensional". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_scoretype (#PCDATA )>

<!-->
<!-->
<!-- ++++++ -->
<!-- Explanation: -->
<!-- Whether or not Sections are included available. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_sectionsincluded (#PCDATA )>

<!-->
<!-->
<!-- ++++++ -->
<!-- Explanation: -->
<!-- Whether or not solutions are available. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Yes/No entry. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_solutionsavailable (#PCDATA )>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Support for Section selection. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No support for Section selection. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_sectionselection (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Support for Section sequencing. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No support for Section sequencing. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_sectionsequence (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Support for Item selection. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No support for Item selection. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_itemselection (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Support for Item sequencing. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Yes/No support for Item sequencing. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_itemsequence (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The status of the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!--     The options are: "Experimental", "Normal" or "Retired". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_status (#PCDATA )>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Whether or not the response are timed. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- A Yes/No statement. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_timedependence (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The number of minutes or an unlimited duration. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Either an integer number of minutes or the string -->
<!-- "Unlimited". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_timelimit (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The name of the vendor of the tool creating the -->
<!-- Assessment. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_toolvendor (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- A brief description of the topic covered by the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Text-based description of the Item's topic. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_topic (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The type of material used within the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The style of the list is as per the MIME formats. -->
<!-- The full range of text, video, audio, etc. formats used.-->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_material (#PCDATA )>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The type of solution available in the Item. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options to be used are: "Complete", "Incremental" -->
<!--     "Multilevel" and "Proprietary". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_typeofsolution (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The education level for which the Item is intended. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The options are: "Pre-school", "School" or "HE/FE", -->
<!--     "Vocational" and "Professional Development". -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_levelofdifficulty (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The weighting of the Item used in the scoring. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     This informatin can be used to enable Items of a -->
<!--     particular weighting. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qmd_weighting (#PCDATA )>

```

```
<!-- ***** -->
<!-- ***** -->
<!-- -->
<!-- ELEMENTS used by more than one object. -->
<!-- Refer to the information model for specific information -->
<!-- on these common elements. -->
<!-- -->
<!-- The common elements are: -->
<!-- -->
<!-- 1. qticomment - QTI comments within the XML file. -->
<!-- 2. material - information to be presented to the user. -->
<!-- 3. mattext - textual information to be presented. -->
<!-- 4. matimage - graphics/images to be presented. -->
<!-- 5. mataudio - audio to be presented. -->
<!-- 6. matvideo - video to be presented. -->
<!-- 7. matapplet- Java applets to be invoked. -->
<!-- 8. matapplication - applications to be invoked. -->
<!-- 9. matref - ref to internal material defined elsewhere. -->
<!-- 10. altmaterial - alternative material to be displayed. -->
<!-- 11. decvar - variable declarations. -->
<!-- 12. setvar - setting the value of a variable. -->
<!-- 13. conditionvar - conditions to be applied to variables. -->
<!-- 14. interpretvar - interpretations for variables. -->
<!-- 15. varequal - variable equivalence test. -->
<!-- 16. varlt - variable less than test. -->
<!-- 17. varlte - variable less than or equal to test. -->
<!-- 18. vargt - variable greater than test. -->
<!-- 19. vargte - variable greater than or equal to test. -->
<!-- 20. varsubset - variable is contained. -->
<!-- 21. varinside - variable XY-value is inside an area. -->
<!-- 22. durequal - duration equivalence test. -->
<!-- 23. durlt - duration less than test. -->
<!-- 24. durlte - duration less than or equal to test. -->
<!-- 25. durgt - duration greater than test. -->
<!-- 26. durgte - duration greater than or equal to test. -->
<!-- 27. not - logical 'NOT' test. -->
<!-- 28. and - logical 'AND' of contained elements. -->
<!-- 29. or - logical 'OR' of contained elements. -->
<!-- 30. other - catch-all response handler. -->
<!-- 31. unanswered - unanswered response handler. -->
<!-- 32. duration - duration of the activity. -->
<!-- 33. displayfeedback - display feedback trigger. -->
<!-- 34. scorecondition - display feedback trigger. -->
<!-- 35. scores - Assessment/Section level scoring. -->
<!-- 36. objectives - Assessment/Section/Item objectives. -->
<!-- -->
<!-- ***** -->
<!-- ***** -->
```



```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Comments used to annotate the XML file. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Comments should be used to aid human readability of -->
<!--     the XML file itself. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT qticomment (#PCDATA )>
<!ATTLIST qticomment e-dtype NMTOKEN #FIXED 'string' >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The container for material to be presented. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Each type of material has its own sub-element. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT material (qticomment? , (mattext | matimage | mataudio | matvideo
| matapplet | matapplication | matref | mat_extension )+ ,
altmaterial?)>
<!ATTLIST material %I_Label; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Textual material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT mattext (#PCDATA )>
<!ATTLIST mattext texttype CDATA 'text/plain'
%I_Label;
%I_CharSet;
%I_Uri; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Graphic/image material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!--     Default type is jpeg. The parser must be capable of -->
<!--     handling others in the format of '*/'. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT matimage (#PCDATA )>
<!ATTLIST matimage imagetype CDATA 'image/jpeg'
%I_Label;
%I_Height;
%I_Uri;

```

```

        %I_Embedded;
        %I_Width;
        %I_Y0;
        %I_X0; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Audio material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!--     Default type is basic. The parsers must be capable -->
<!--     of handling other types in the form '***/*'. -->
<!-- ++++++ -->
<!ELEMENT mataudio (#PCDATA )>
<!ATTLIST mataudio audiotype CDATA 'audio/base'
        %I_Label;
        %I Uri;
        %I_Embedded; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Video material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!--     Default type is 'avi'. The parsers must be capable -->
<!--     of handling other types in the form '***/*'. -->
<!-- ++++++ -->
<!ELEMENT matvideo (#PCDATA )>
<!ATTLIST matvideo videotype CDATA 'video/avi'
        %I_Label;
        %I Uri;
        %I_Width;
        %I_Height;
        %I_Y0;
        %I_X0;
        %I_Embedded; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Java applet material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!-- ++++++ -->
<!ELEMENT matapplet (#PCDATA )>
<!ATTLIST matapplet %I_Label;
        %I Uri;
        %I_Y0;
        %I_Height;
        %I_Width;
        %I_X0;

```

```

                                %I_Embedded; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Application material to be presented. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT matapplication (#PCDATA )>
<!ATTLIST matapplication  apptype    CDATA    #IMPLIED
                                %I_Label;
                                %I_Uri;
                                %I_Embedded; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Reference to material that is defined elsewhere -->
<!--     within the file. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT matref (#PCDATA )>
<!ATTLIST matref  %I_LinkRefId; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Alternative material to be displayed if the primary -->
<!--     material cannot be rendered. -->
<!-- Type: -->
<!--     PCDATA -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT altmaterial (qticomment? , (mattext | matimage | mataudio |
                                matvideo | matapplet | matapplication | matref | mat_extension )+ )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Declaration of variables to be used. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Each type of variable must be declared before it is -->
<!--     used. -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT decvar (#PCDATA )>
<!ATTLIST decvar  %I_VarName;
                                vartype    (Integer |
                                                String |

```

```

                                Decimal |
                                Scientific |
                                Boolean |
                                Enumerated |
                                Set ) 'Integer'
    defaultval CDATA #IMPLIED
    minvalue   CDATA #IMPLIED
    maxvalue   CDATA #IMPLIED
    members    CDATA #IMPLIED >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The type of processing to be applied to the variable. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The variable must have be defined. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT setvar (#PCDATA )>
<!ATTLIST setvar %I_VarName;
              action (Set |
                    Add |
                    Subtract |
                    Multiply |
                    Divide ) 'Set' >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The interpretation to be applied to the variable in -->
<!-- terms relevant to an actor. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The variable must have be defined. This element will -->
<!-- be refined in Version 2.0. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT interpretvar (material )>
<!ATTLIST interpretvar %I_View;
                    %I_VarName; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The conditions to be applied to the variables as a -->
<!-- part of their processing. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Each of the conditions provides a boolean test. -->
<!-- Consecutive conditions are linked as an 'AND' -->
<!-- condition. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT conditionvar (not | and | or | unanswered | other | varequal |
    varlt | varlte | vargt | vargte | varsubset | varinside | durequal |
    durlt | durlte | durgt | durgte | var_extension )+>

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     To invert the value of the enclosed variable test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT not (and | or | unanswered | other | varequal | varlt | varlte |
    vargt | vargte | varsubset | varinside | durequal | durlt | durlte |
    durgt | durgte )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The logical 'AND' operation. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Returns a 'True' statement if all conditions are -->
<!--     'True'. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT and (not | and | or | unanswered | other | varequal | varlt |
    varlte | vargt | vargte | varsubset | varinside | durequal | durlt |
    durlte | durgt | durgte )+>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The logical 'OR' operation. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Returns a 'True' statement if one condition is 'True' -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT or (not | and | or | unanswered | other | varequal | varlt | varlte
    | vargt | vargte | varsubset | varinside | durequal | durlt | durlte |
    durgt | durgte )+>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Variable equivalence comparison test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     'True' is returned if equivalent. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT varequal (#PCDATA )>
<!ATTLIST varequal %I_RespIdent;
    %I_Case; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Variable less than comparison test. -->

```

```

<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' is returned if less than the value. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT varlt (#PCDATA )>
<!ATTLIST varlt %I_RespIdent; >

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Variable less than or equal to comparison test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if less than or equal to the value. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT varlte (#PCDATA )>
<!ATTLIST varlte %I_RespIdent; >

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Variable greater than comparison test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' is returned if greater than the value. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT vargt (#PCDATA )>
<!ATTLIST vargt %I_RespIdent; >

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Variable greater than or equal to comparison test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if greater or equal to the value. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT vargte (#PCDATA )>
<!ATTLIST vargte %I_RespIdent; >

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Variable comparison to a predefined set. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if a member of the set. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT varsubset (#PCDATA )>
<!ATTLIST varsubset %I_Case;
                    %I_RespIdent;

```

```

                setmatch      (Exact | Partial ) 'Exact' >

<!-- ++++++----- -->
<!-- Explanation: ----->
<!--      Determination if variable is within a defined area. ----->
<!-- Type: ----->
<!-- ----->
<!-- Notes: ----->
<!--      'True' returned if the XY-coord is within the area. ----->
<!-- ----->
<!-- ++++++----- -->
<!ELEMENT varinside  (#PCDATA )>
<!ATTLIST varinside  areatype      (Ellipse | Rectangle | Bounded ) #REQUIRED
                %I_RespIdent; >

<!------->
<!------->
<!-- ++++++----- -->
<!-- Explanation: ----->
<!--      Duration equivalence comparison test. ----->
<!-- Type: ----->
<!-- ----->
<!-- Notes: ----->
<!--      'True' is returned if equivalent. ----->
<!--      For further study in V2.0. ----->
<!-- ----->
<!-- ++++++----- -->
<!ELEMENT durequal  (#PCDATA )>

<!-- ++++++----- -->
<!-- Explanation: ----->
<!--      Duration less than comparison test. ----->
<!-- Type: ----->
<!-- ----->
<!-- Notes: ----->
<!--      'True' is returned if less than the value. ----->
<!--      For further study in V2.0. ----->
<!-- ----->
<!-- ++++++----- -->
<!ELEMENT durlt  (#PCDATA )>

<!------->
<!------->
<!-- ++++++----- -->
<!-- Explanation: ----->
<!--      Duration less than or equal to comparison test. ----->
<!-- Type: ----->
<!-- ----->
<!-- Notes: ----->
<!--      'True' is returned if less than the value. ----->
<!--      For further study in V2.0. ----->
<!-- ----->
<!-- ++++++----- -->
<!ELEMENT durlte  (#PCDATA )>

<!-- ++++++----- -->
<!-- Explanation: ----->
<!--      Duration greater than comparison test. ----->

```

```

<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' is returned if greater than the value. -->
<!-- For further study in V2.0. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT durgt (#PCDATA )>

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Duration greater than or equal to comparison test. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if greater or equal to the value. -->
<!-- For further study in V2.0. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT durgte (#PCDATA )>

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Condition for an unanswered response. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if no response supplied. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT unanswered (#PCDATA )>
<!ATTLIST unanswered %I_RespIdent; >

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Condition for conditions not defined. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- 'True' returned if not defined condition occurs. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT other (#PCDATA )>

<!-- +-----+ -->
<!-- Explanation: -->
<!-- Permitted duration of the activity. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Defined as per ISO8601. Use the text based layout -->
<!-- with the corresponding interpretation. -->
<!-- -->
<!-- +-----+ -->
<!ELEMENT duration (#PCDATA )>

<!-- +-----+ -->

```



```

<!-- Explanation: -->
<!--     Display feedback trigger. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT displayfeedback (#PCDATA )>
<!ATTLIST displayfeedback feedbacktype (Response | Solution | Hint )
        'Response'
        %I_LinkRefId; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Score processing for Sections and Assessments. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Used by both Sections and Assessments. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT scorecondition (qticomment? , conditionvar , setvar* ,
        displayfeedback* , scorecondition_extension? )>
<!ATTLIST scorecondition %I_Title;
        %I_Continue; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Creation of the response scoring variables. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The assessment accumulated processing variable group. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT scores (qticomment? , (decvar | interpretvar )+ )>

<!-->
<!-->
<!-- ++++++ -->
<!-- Explanation: -->
<!--     Assessment/Section/Item objectives presented to the -->
<!--     user. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     Each objective will be defined with respect to a -->
<!--     view e.g. tutor, candidate, etc. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT objectives (qticomment? , material )>
<!ATTLIST objectives %I_View; >

<!-- ELEMENTS extensions that have been made available. -->
<!-- Refer to the information model for specific information -->
<!-- on these extensions. -->
<!-- -->

```

```

<!-- The extension elements are: -->
<!-- -->
<!-- 1. mat_extension - proprietary extension for material. -->
<!-- 2. var_extension - proprietary extension for condition. -->
<!-- 3. response_extension - responses proprietary extension. -->
<!-- 4. render_extension - rendering proprietary extension. -->
<!-- 5. assesscon_extension - Assessm't condition ext'sion. -->
<!-- 6. assessproc_extension - Assessm't processing ext'sion. -->
<!-- 7. sectionproc_extension - Section processing extension. -->
<!-- 8. Iitemproc_extension - Item processing extension. -->
<!-- 9. respcnd_extension - response condition extension. -->
<!-- 10. condition_extension - condition extension. -->
<!-- -->
<!-- ***** -->
<!-- ***** -->

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Proprietary extension support for materials. -->
<!-- Type: -->
<!-- Any valid element, PCDATA. -->
<!-- Notes: -->
<!-- Acts as a high level element for any extensions to -->
<!-- the data objects. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT mat_extension ANY>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Proprietary extension support for variable condition -->
<!-- comparisons. -->
<!-- Type: -->
<!-- Any valid element, PCDATA. -->
<!-- Notes: -->
<!-- Acts as a high level element for any extensions to -->
<!-- the data objects. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT var_extension ANY>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Proprietary extension support for response types. -->
<!-- Type: -->
<!-- Any valid element, PCDATA. -->
<!-- Notes: -->
<!-- Acts as a high level element for any extensions to -->
<!-- the response objects. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_extension ANY>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Proprietary extension support for rendering types. -->
<!-- Type: -->

```

```

<!--      Any valid element, PCDATA.      -->
<!-- Notes:      -->
<!--      Acts as a high level element for any extensions to      -->
<!--      the rendering objects.      -->
<!--      -->
<!--      ++++++      -->
<!ELEMENT render_extension ANY>

<!--      ++++++      -->
<!-- Explanation:      -->
<!--      Proprietary extension support Assessment processing.      -->
<!-- Type:      -->
<!--      Any valid element, PCDATA.      -->
<!-- Notes:      -->
<!--      Acts as an extension element for any extensions to      -->
<!--      Assessment processing.      -->
<!--      -->
<!--      ++++++      -->
<!ELEMENT assessproc_extension ANY>

<!--      ++++++      -->
<!-- Explanation:      -->
<!--      Proprietary extension support Section processing.      -->
<!-- Type:      -->
<!--      Any valid element, PCDATA.      -->
<!-- Notes:      -->
<!--      Acts as an extension element for any extensions to      -->
<!--      Section processing.      -->
<!--      -->
<!--      ++++++      -->
<!ELEMENT sectionproc_extension ANY>

<!--      ++++++      -->
<!-- Explanation:      -->
<!--      Proprietary extension support Item processing.      -->
<!-- Type:      -->
<!--      Any valid element, PCDATA.      -->
<!-- Notes:      -->
<!--      Acts as an extension element for any extensions to      -->
<!--      Item processing.      -->
<!--      -->
<!--      ++++++      -->
<!ELEMENT itemproc_extension ANY>

<!--      ++++++      -->
<!-- Explanation:      -->
<!--      Proprietary extension support response conditions.      -->
<!-- Type:      -->
<!--      Any valid element, PCDATA.      -->
<!-- Notes:      -->
<!--      Acts as an extension element for any extensions to      -->
<!--      Item conditions in Item processing.      -->
<!--      -->
<!--      ++++++      -->
<!ELEMENT respcnd_extension ANY>

<!--      ++++++      -->

```

```
<!-- Explanation: -->
<!-- Proprietary extension to support scoring conditions. -->
<!-- Type: -->
<!-- Any valid element, PCDATA. -->
<!-- Notes: -->
<!-- Acts as an extension element for any extensions to -->
<!-- Score conditions in Section/Assessment processing. -->
<!-- ++++++ -->
<!ELEMENT scorecondition_extension ANY>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Proprietary extension to support conditions. -->
<!-- Type: -->
<!-- Any valid element, PCDATA. -->
<!-- Notes: -->
<!-- Acts as an extension element for any extensions to -->
<!-- Section/Assessment processing. -->
<!-- ++++++ -->
<!ELEMENT condition_extension ANY>
```

```

<!-- ***** -->
<!-- ***** -->
<!-- ***** -->
<!--
<!-- Main Objects
<!-- =====
<!--
<!--     The main objects are:
<!--
<!--     1     Assessment
<!--     2     Section
<!--     3     Item
<!--
<!-- ***** -->
<!-- ***** -->
<!-- ***** -->
<!-- ***** -->
<!-- ***** -->
<!--     ### This is the ASSESSMENT object. ###
<!--
<!--     #####
<!-- ***** -->
<!-- ***** -->
<!--
<!-- The Assessment object contains all of the information to
<!-- make the use of individual Items meaningful i.e. apart from
<!-- the Items the object includes the relationship between the
<!-- Items, the group evaluation processing and the
<!-- corresponding feedback.
<!--
<!--
<!-- Defined Elements
<!-- =====
<!--
<!-- 1.     assessmentmetadata
<!-- 2.     assessmentcontrol
<!-- 3.     assessprocessing
<!-- 4.     scores
<!-- 5.     assesscondition
<!-- 6.     assessfeedback
<!-- 7.     sectionselection
<!-- 8.     sectionsequence
<!-- 9.     sectionref
<!--
<!-- Defined Attributes
<!-- =====
<!--
<!-- 1.     Title - title of the assessment
<!-- 2.     Identity - mandatory label for the Assessment
<!--
<!-- ++++++
<!ELEMENT assessment (qticomment? , duration? , assessmentmetadata? ,
    objectives* , assessmentcontrol* , assessprocessing? ,
    assessproc_extension? , assessfeedback* , (sectionref | section )+ ,
    sectionselection* , sectionsequence* )>
<!ATTLIST assessment %I_Ident;
    %I_Title; >

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Assessment meta-data descriptions. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- Defined as per the meta-data definition. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT assessmentmetadata (qmd_absolutescore? , qmd_assessmenttype? ,
qmd_feedbackavailable? , qmd_hintsavailable? , qmd_scoretype ,
qmd_solutionsavailable? , qmd_sectionselection? , qmd_sectionsequence? ,
qmd_itemselection? , qmd_itemsequence? , qmd_timelimit? ,
qmd_toolvendor? , qmd_material* )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Switches to be set for the Assessment. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- These switches should be used to control the -->
<!-- operation of the Assessment related conditions. -->
<!-- These switches are defined per actor. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT assessmentcontrol (qticomment? )>
<!ATTLIST assessmentcontrol %I_HintSwitch;
%I_SolutionSwitch;
%I_View;
%I_FeedbackSwitch; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Assessment accumulated processing and feedback. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- This element is similar in nature to the -->
<!-- ResProcessing and SectionProcessing elements. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT assessprocessing (qticomment? , scores , scorecondition* ,
condition_extension? )>
<!ATTLIST assessprocessing %I_ScoreModel; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Feedback of the assessment processing conclusion. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The feedback will be determined by the conditions. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT assessfeedback (qticomment? , material? )>
<!ATTLIST assessfeedback %I_View;

```

```

                                %I_Ident;
                                %I_Title; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     To pull into scope the Sections that are not defined -->
<!--     within this Assessment block. -->
<!-- Type: -->
<!-- Notes: -->
<!--     The referenced Section must be available somewhere -->
<!--     otherwise execution errors will occur. Binding is -->
<!--     outside the scope of this specification. -->
<!-- ++++++ -->
<!ELEMENT sectionref (#PCDATA )>
<!ATTLIST sectionref %I_LinkRefId; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Deciding which Sections are required. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionselection (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Deciding the sequencing of the Sections. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionsequence (#PCDATA )>

```

```

<!-- ***** -->
<!-- ***** -->
<!--     ### This is the SECTION object.  ### -->
<!--     -->
<!--     ##### -->
<!-- ***** -->
<!-- ***** -->
<!--     -->
<!-- The Section object contains all of the information to -->
<!-- meaningfully group together Items i.e. apart from the -->
<!-- Items the object includes the relationships between the -->
<!-- Items and the selection criteria of the Items. -->
<!--     -->
<!--     -->
<!-- Defined Elements -->
<!-- ===== -->
<!--     -->
<!-- 1.    sectionmetadata -->
<!-- 2.    sectionprecondition -->
<!-- 3.    sectionpostcondition -->
<!-- 4.    sectioncontrol -->
<!-- 5.    itemref -->
<!-- 6.    itemselection -->
<!-- 7.    itemsequence -->
<!-- 8.    sectionprocessing -->
<!-- 9.    sectionfeedback -->
<!--     -->
<!-- Defined Attributes -->
<!-- ===== -->
<!--     -->
<!-- 1.    Title - title of the Section -->
<!-- 2.    Ident - the unique Section identifier -->
<!--     -->
<!--     ++++++ -->
<!ELEMENT section (qticomment? , duration? , sectionmetadata? ,
  sectionprecondition* , sectionpostcondition* , objectives* ,
  sectioncontrol* , (sectionref | section )* , sectionselection* ,
  sectionsequence* , sectionprocessing? , sectionproc_extension? ,
  sectionfeedback* , (itemref | item)* , itemselection* , itemsequence*
 )>
<!ATTLIST section %I_Ident;
                %I_Title; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Section meta-data descriptions. -->
<!-- Type: -->
<!--     -->
<!-- Notes: -->
<!--     Defined as per the meta-data definition. -->
<!--     -->
<!--     ++++++ -->
<!ELEMENT sectionmetadata (qmd_numberofitems , qmd_sectionsincluded ,
  qmd_sectionselection? , qmd_sectionsequence? , qmd_itemselection? ,
  qmd_itemsequence? , qmd_timelimit? , qmd_material* )>

```



```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Precondition decision before activating the Section. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionprecondition (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Postcondition decision activated after the Section -->
<!--     has been completed. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionpostcondition (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Switches to be set for the Section. -->
<!-- Type: -->
<!-- Notes: -->
<!--     These switches should be used to control the -->
<!--     operation of the Section related conditions. -->
<!--     Defined per actor. -->
<!-- ++++++ -->
<!ELEMENT sectioncontrol (qticomment? )>
<!ATTLIST sectioncontrol %I_FeedbackSwitch;
                        %I_HintSwitch;
                        %I_SolutionSwitch;
                        %I_View; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     To pull into scope the Items that are not defined -->
<!--     within this Section block. -->
<!-- Type: -->
<!-- Notes: -->
<!--     The referenced Item must be available somewhere -->
<!--     otherwise execution errors will occur. Binding is -->
<!--     outside the scope of this specification. -->
<!-- ++++++ -->
<!ELEMENT itemref (#PCDATA )>
<!ATTLIST itemref %I_LinkRefId; >

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Deciding which Items are required. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT itemselection (#PCDATA )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Deciding the sequence Items are to be used. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT itemsequence (#PCDATA )>

<!-->
<!-->
<!-- ++++++ -->
<!-- Explanation: -->
<!--     Processing of the Section accumulated responses and -->
<!--     scores. -->
<!-- Type: -->
<!--     For further study in V2.0. -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionprocessing (qticomment? , scores , scorecondition+ ,
    condition_extension )>
<!ATTLIST sectionprocessing %I_ScoreModel; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Feedback of the Section processing conclusions. -->
<!-- Type: -->
<!-- Notes: -->
<!--     For further study in V2.0. -->
<!-- ++++++ -->
<!ELEMENT sectionfeedback (qticomment? , material )>
<!ATTLIST sectionfeedback %I_View;
    %I_Ident;
    %I_Title; >

```

```

<!-- ***** -->
<!-- ***** -->
<!--      ### This is the Item object.  ###      -->
<!--      -->
<!--      #####      -->
<!-- ***** -->
<!-- ***** -->
<!--      -->
<!-- An Item object contains all of the information for the -->
<!-- presentation of a question and its subsequent processing -->
<!-- to the user. The structure of the Item includes the actual -->
<!-- question and its presentation format, the range of possible -->
<!-- responses, the ways in which the responses are to be -->
<!-- processed, and the possible solutions and hints to the -->
<!-- Item.      -->
<!--      -->
<!--      -->
<!-- Defined Elements      -->
<!-- =====      -->
<!--      -->
<!-- 1.      itemmetadata      -->
<!-- 2.      itemobjectives      -->
<!-- 3.      itemcontrol      -->
<!-- 4.      itemprecondition      -->
<!-- 5.      itempostcondition      -->
<!-- 6.      itemrubric      -->
<!-- 7.      presentation      -->
<!-- 8.      response_lid      -->
<!-- 9.      response_xy      -->
<!-- 10.     response_str      -->
<!-- 11.     response_num      -->
<!-- 12.     response_grp      -->
<!-- 13.     response_label      -->
<!-- 14.     render_choice      -->
<!-- 15.     render_hotspot      -->
<!-- 16.     render_slider      -->
<!-- 17.     render_fib      -->
<!-- 18.     resprocessing      -->
<!-- 19.     resprecondition      -->
<!-- 20.     outcomes      -->
<!-- 21.     itemfeedback      -->
<!-- 22.     solution      -->
<!-- 23.     solutionmaterial      -->
<!-- 24.     hint      -->
<!-- 25.     hintmaterial      -->
<!--      -->
<!--      -->
<!-- Defined Attributes      -->
<!-- =====      -->
<!--      -->
<!-- 1.      title - title of the Item      -->
<!-- 2.      ident - the unique Item identifier      -->
<!--      -->
<!-- ++++++      -->
<!-- ELEMENT item (qtacomment? , duration? , itemmetadata? , objectives* ,
      itemcontrol* , itemprecondition* , itempostcondition* , itemrubric* ,
      presentation? , resprocessing* , itemproc_extension? , itemfeedback* )>

```

```

<!ATTLIST item maxattempts CDATA #IMPLIED
              %I_Label;
              %I_Ident;
              %I_Title; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Item meta-data descriptions. -->
<!-- Type: -->
<!-- Notes: -->
<!-- Defined as per the meta-data definition. -->
<!-- ++++++ -->
<!ELEMENT itemmetadata (qmd_computerscored? , qmd_feedbackavailable? ,
qmd_hintsavailable? , qmd_itemtype , qmd_levelofdifficulty? ,
qmd_maximumscore , qmd_renderingtype+ , qmd_responsetype+ ,
qmd_scoringavailable? , qmd_solutionsavailable? , qmd_status? ,
qmd_timedependence? , qmd_timelimit? , qmd_toolvendor? , qmd_topic? ,
qmd_material* , qmd_typeofsolution? , qmd_weighting? )>

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Item objectives presented to the user. -->
<!-- Type: -->
<!-- Notes: -->
<!-- Each objective will be defined with respect to a -->
<!-- view e.g. tutor, candidate, etc. -->
<!-- ++++++ -->
<!ELEMENT itemobjectives (qticomment? , material )>
<!ATTLIST itemobjectives %I_View; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Switches to be set for the Item. -->
<!-- Type: -->
<!-- Notes: -->
<!-- These switches should be used to control the -->
<!-- operation of the Section related conditions. -->
<!-- Defined per actor. -->
<!-- ++++++ -->
<!ELEMENT itemcontrol (qticomment? )>
<!ATTLIST itemcontrol %I_FeedbackSwitch;
                    %I_HintSwitch;
                    %I_SolutionSwitch;
                    %I_View; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- Precondition decision before activating the Item. -->
<!-- Type: -->
<!-- For further study in V2.0. -->
<!-- Notes: -->

```

```

<!--          For further study in V2.0.          -->
<!--          -->
<!--          ++++++          -->
<!ELEMENT itemprecondition (#PCDATA )>

<!--          ++++++          -->
<!-- Explanation:          -->
<!--          Postcondition decision after the Item has been          -->
<!--          completed.          -->
<!-- Type:          -->
<!--          For further study in V2.0.          -->
<!-- Notes:          -->
<!--          For further study in V2.0.          -->
<!--          -->
<!--          ++++++          -->
<!ELEMENT itempostcondition (#PCDATA )>

<!--          ++++++          -->
<!-- Explanation:          -->
<!--          The view specific description of how to attempt the          -->
<!--          questions.          -->
<!-- Type:          -->
<!--          Standard CONTENT.          -->
<!-- Notes:          -->
<!--          Will not normally contain content specific to a          -->
<!--          question.          -->
<!--          -->
<!--          ++++++          -->
<!ELEMENT itemrubric (material )>
<!ATTLIST itemrubric %I_View; >

<!--          ++++++          -->
<!-- Explanation:          -->
<!--          The question response and rendering container.          -->
<!-- Type:          -->
<!--          -->
<!-- Notes:          -->
<!--          Each Presentation will consist of response types          -->
<!--          and rendering forms A simple presentation has just          -->
<!--          one ResponseType whereas complex responses will be          -->
<!--          based upon several ResponseTypes.          -->
<!--          -->
<!--          ++++++          -->
<!ELEMENT presentation (qticomment? , material* , ( (response_lid |
response_xy | response_str | response_num | response_grp |
response_extension ) , material* )+ )>
<!ATTLIST presentation %I_Label; >

<!--          ++++++          -->
<!-- Explanation:          -->
<!--          The LID type of response expected and its possible          -->
<!--          rendering.          -->
<!-- Type:          -->
<!--          -->
<!-- Notes:          -->
<!--          Logical identifier of the selected response(s).          -->
<!--          -->

```

```

<!-- ++++++ -->
<!ELEMENT response_lid (material? , (render_choice | render_hotspot |
  render_slider | render_fib | render_extension ) , material? )>
<!ATTLIST response_lid %I_Rcardinality;
  %I_Rtiming;
  %I_Ident; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The XY type of response expected and its possible -->
<!-- renderings. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- XY co-ordinates of the selected response(s). -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_xy (material? , (render_choice | render_hotspot |
  render_slider | render_fib | render_extension ) , material? )>
<!ATTLIST response_xy %I_Rcardinality;
  %I_Rtiming;
  %I_Ident; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The STR type of response expected and its possible -->
<!-- renderings. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The string entered by the user as the response(s). -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_str (material? , (render_choice | render_hotspot |
  render_slider | render_fib | render_extension ) , material? )>
<!ATTLIST response_str %I_Rcardinality;
  %I_Ident;
  %I_Rtiming; >

<!-- ++++++ -->
<!-- Explanation: -->
<!-- The NUM type of response expected and its possible -->
<!-- renderings. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- The number entered by the user as the response(s). -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_num (material? , (render_choice | render_hotspot |
  render_slider | render_fib | render_extension ) , material? )>
<!ATTLIST response_num numtype (Integer | Decimal | Scientific) 'Integer'
  %I_Rcardinality;
  %I_Ident;
  %I_Rtiming; >

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The GRP type of response expected and its possible -->
<!--     renderings. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The grouped identifiers of the selected response(s). -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_grp (material? , (render_choice | render_hotspot |
    render_slider | render_fib | render_extension ) , material? )>
<!ATTLIST response_grp %I_Rcardinality;
    %I_Ident;
    %I_Rtiming; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The range of possible responses available. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     The attributes used depend upon the form of -->
<!--     rendering. -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_label (#PCDATA | qticomment | material )*>
<!ATTLIST response_label rshuffle (Yes | No ) 'Yes'
    rarea (Ellipse | Rectangle | Bounded )
        'Ellipse'
    rrange (Exact | Range ) 'Exact'
    labelrefid CDATA #IMPLIED
    %I_Ident; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Proprietary extension for unanswered Response labels. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT response_na ANY>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Classical multiple choice, multiple response and -->
<!--     true/false selection list. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT render_choice ( (material | response_label )* , response_na? )>
<!ATTLIST render_choice shuffle (Yes | No ) 'No'

```

```

                                %I_MinNumber;
                                %I_MaxNumber; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The image hot spot rendering. -->
<!-- Type: -->
<!-- Notes: -->
<!--     Defines the images to which the responses are -->
<!--     referenced. -->
<!-- ++++++ -->
<!ELEMENT render_hotspot ( (material | response_label )* , response_na? )>
<!ATTLIST render_hotspot %I_MaxNumber;
                        %I_MinNumber;
                        showdraw (Yes | No ) 'No' >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Slider rendering format. -->
<!-- Type: -->
<!-- Notes: -->
<!-- ++++++ -->
<!ELEMENT render_slider ( (material | response_label )* , response_na? )>
<!ATTLIST render_slider orientation (Horizontal | Vertical ) 'Horizontal'
                        lowerbound CDATA #REQUIRED
                        upperbound CDATA #REQUIRED
                        step CDATA #IMPLIED
                        startval CDATA #IMPLIED
                        steplabel (Yes | No ) 'No'
                        %I_MaxNumber;
                        %I_MinNumber; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The Fill-in-blank (FIB) rendering. -->
<!-- Type: -->
<!-- Notes: -->
<!-- ++++++ -->
<!ELEMENT render_fib ( (material | response_label )* , response_na? )>
<!ATTLIST render_fib encoding CDATA 'UTF_8'
                        fibtype (String | Integer | Decimal | Scientific )
                        'String'
                        rows CDATA #IMPLIED
                        maxchars CDATA #IMPLIED
                        prompt (Box | Dashline | Asterisk | Underline )
                        #IMPLIED
                        columns CDATA #IMPLIED
                        %I_CharSet;
                        %I_MaxNumber;

```



```

                                %I_MinNumber;
                                a-dtype      NMTOKENS  'rows      int
                                                maxchars int
                                                columns  int' >

<!-- ++++++----- -->
<!-- Explanation: ----- -->
<!--      Evaluation processing of the user Item responses. ----- -->
<!-- Type: ----- -->
<!-- Notes: ----- -->
<!-- ----- -->
<!-- ++++++----- -->
<!ELEMENT respprocessing (qticomment? , outcomes , (respcondition |
    itemproc_extension )+ )>
<!ATTLIST respprocessing %I_ScoreModel; >

<!-- ++++++----- -->
<!-- Explanation: ----- -->
<!--      Declaration of the Item scoring variables. ----- -->
<!-- Type: ----- -->
<!-- Notes: ----- -->
<!-- ----- -->
<!-- ++++++----- -->
<!ELEMENT outcomes (qticomment? , (decvar | interpretvar )+ )>

<!-- ++++++----- -->
<!-- Explanation: ----- -->
<!--      Control of the Item response evaluation. ----- -->
<!-- Type: ----- -->
<!-- Notes: ----- -->
<!-- ----- -->
<!-- ++++++----- -->
<!ELEMENT respcondition (qticomment? , conditionvar , setvar* ,
    displayfeedback* , respcond_extension? )>
<!ATTLIST respcondition %I_Continue;
                                %I_Title; >

<!-- ++++++----- -->
<!-- Explanation: ----- -->
<!--      Feedback in response to the evaluation. ----- -->
<!-- Type: ----- -->
<!--      For further study in V2.0. ----- -->
<!-- Notes: ----- -->
<!--      For further study in V2.0. ----- -->
<!-- ----- -->
<!-- ++++++----- -->
<!ELEMENT itemfeedback (material | solution+ | hint+ )>
<!ATTLIST itemfeedback %I_View;
                                %I_Ident;
                                %I_Title; >

```

```

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The Solution to be revealed to the user. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!--     If the type is 'Complete' then only a single -->
<!--     SOLUTIONMATERIAL should be supplied.  If the type is -->
<!--     'Multilevel' then each SOLUTIONMATERIAL is treated as -->
<!--     a separate solution.  If the type is 'Incremental' -->
<!--     then a series of steps are presented. -->
<!-- ++++++ -->
<!ELEMENT solution (qticomment? , solutionmaterial+ )>
<!ATTLIST solution  %I_FeedbackStyle; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Container for the set of contents to be revealed as -->
<!--     a solution. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT solutionmaterial (material )>

<!-- ++++++ -->
<!-- Explanation: -->
<!--     The Hint that can be presented to the user. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT hint (qticomment? , hintmaterial+ )>
<!ATTLIST hint  %I_FeedbackStyle; >

<!-- ++++++ -->
<!-- Explanation: -->
<!--     Container for the set of contents to be revealed as -->
<!--     a hint. -->
<!-- Type: -->
<!-- -->
<!-- Notes: -->
<!-- -->
<!-- -->
<!-- ++++++ -->
<!ELEMENT hintmaterial (material )>

```

## 4. Example XML Schema

### 4.1 Item XML Schema

The following example consists of two Items.

```
<?xml version="1.0"?>
<!DOCTYPE questestinterop "IMS_QTIv1p0.dtd">
<questestinterop>
  <item title="Capital of France" ident="I01" maxattempts="6">
    <qtcomment>
      This Item is the first example to be used in the QTI XML Binding Base Document.
    </qtcomment>
    <itemmetadata/>
    <itemrubric view="Candidate">
      <material>
        <mattext>Choose only one of the choices available.</mattext>
      </material>
    </itemrubric>
    <presentation label="Resp001">
      <response_lid ident="LID01">
        <material>
          <mattext>What is the Capital of France ?</mattext>
        </material>
        <render_choice shuffle="Yes">
          <response_label ident="LID01_A">
            <material>
              <mattext>London</mattext>
            </material>
          </response_label>
          <response_label ident="LID01_B">
            <material>
              <mattext>Paris</mattext>
            </material>
          </response_label>
          <response_label ident="LID01_C">
            <material>
              <mattext>Washington</mattext>
            </material>
          </response_label>
          <response_label ident="LID01_D" rshuffle="No">
            <material>
              <mattext>Berlin</mattext>
            </material>
          </response_label>
        </render_choice>
      </response_lid>
    </presentation>
  </resprocessing>
  <qtcomment/>
  <outcomes>
    <decvar vartype="Integer" defaultval="0"/>
  </outcomes>
  <rescondition>
    <qtcomment>Scoring for the correct answer.</qtcomment>
    <conditionvar>
      <varequal resident="LID01">LID01_B</varequal>
    </conditionvar>
    <setvar action="Set" varname="SCORE"> 10 </setvar>
    <displayfeedback feedbacktype="Response" linkrefid="I01_IFBK01"/>
  </rescondition>
</resprocessing>
<itemfeedback title="Correct answer" ident="I01_IFBK01">
  <material>
    <mattext>Correct answer.</mattext>
  </material>
</itemfeedback>
<itemfeedback ident="I01_IFBK02">
```

```
<solution>
  <solutionmaterial>
    <material>
      <mattext>
        London is the Capital of England.
        Paris is the Capital of France.
        Washington is in the USA.
        Berlin is the Capital of Germany.
      </mattext>
    </material>
  </solutionmaterial>
</solution>
</itemfeedback>
<itemfeedback ident="I01_IFBK03" view="All">
  <hint feedbackstyle="Multilevel">
    <hintmaterial>
      <material>
        <mattext>One of the choices is not in Europe.</mattext>
      </material>
    </hintmaterial>
    <hintmaterial>
      <material>
        <mattext>Berlin is the Capital of Germany.</mattext>
      </material>
    </hintmaterial>
    <hintmaterial>
      <material>
        <mattext>The Eiffel tower is in the Capital of France.</mattext>
      </material>
    </hintmaterial>
  </hint>
</itemfeedback>
</item>
</questestinterop>
```

## 4.2 Section XML Schema

The following example consists of one section that contains two Items.

```
<?xml version="1.0"?>
<!doctype questestinterop 'IMS_QTivlp0.dtd'>
<questestinterop>
  <qticomment>
    This example consists of two Sections.
  </qticomment>
  <section title="European Capitals" ident="S01">
    <sectionmetadata/>
    <objectives view="Candidate">
      <material>
        <mattext>To assess your knowledge of the capital cities in Europe.
        </mattext>
      </material>
    </objectives>
    <objectives view="Tutor">
      <material>
        <mattext>
          To ensure that the student knows the difference between the Capital cities of
          France, UK, Germany, Spain and Italy.
        </mattext>
      </material>
    </objectives>
    <item title="Capital of France" ident="I01" maxattempts="6">
      <qticomment>
        This Item is the first example to be used in the QTI XML Binding Base Document.
      </qticomment>
      <itemmetadata/>
      <itemrubric view="Candidate">
        <material>
          <mattext>Choose only one of the choices available.</mattext>
        </material>
      </itemrubric>
      <presentation label="Resp001">
        <response_lid ident="LID01">
          <material>
            <mattext>What is the Capital of France ?</MATTEXT>
          </material>
          <render_choice shuffle="Yes">
            <response_label ident="LID01_A">
              <material>
                <mattext>London</mattext>
              </material>
            </response_label>
            <response_label ident="LID01_B">
              <material>
                <mattext>Paris</mattext>
              </material>
            </response_label>
            <response_label ident="LID01_C">
              <material>
                <mattext>Washington</mattext>
              </material>
            </response_label>
            <response_label ident="LID01_D" rshuffle="No">
              <material>
                <mattext>Berlin</mattext>
              </material>
            </response_label>
          </render_choice>
        </response_lid>
      </presentation>
    </resprocessing>
    <qticomment />
    <outcomes>
      <decvar vartype="Integer" defaultval="0"/>
    </outcomes>
  </item>
</section>
</questestinterop>
```

```

    </outcomes>
    <respcondition>
      <qticomment> Scoring for the correct answer. </qticomment>
      <conditionvar>
        <varequal respident="LID01">LID01_B</varequal>
      </conditionvar>
      <setvar action="Set" varname="SCORE"> 10 </setvar>
      <displayfeedback feedbacktype="Response" linkrefid="I01_IFBK01"/>
    </respcondition>
  </resprocessing>
  <itemfeedback title="Correct answer" ident="I01_IFBK01">
    <material>
      <mattext>Correct answer.</mattext>
    </material>
  </itemfeedback>
  <itemfeedback ident="I01_IFBK02">
    <solution>
      <solutionmaterial>
        <material>
          <mattext>
            London is the Capital of England.
            Paris is the Capital of France.
            Washington is in the USA.
            Berlin is the Capital of Germany.
          </mattext>
        </material>
      </solutionmaterial>
    </solution>
  </itemfeedback>
  <itemfeedback ident="I01_IFBK03" view="All">
    <hint feedbackstyle="Multilevel">
      <hintmaterial>
        <material>
          <mattext>One of the choices is not in Europe.</mattext>
        </material>
      </hintmaterial>
      <hintmaterial>
        <material>
          <mattext>Berlin is the Capital of Germany.</mattext>
        </material>
      </hintmaterial>
      <hintmaterial>
        <material>
          <mattext>The Eiffel tower is in the Capital of France.</mattext>
        </material>
      </hintmaterial>
    </hint>
  </itemfeedback>
</item>
</section>
<section title="European Rivers" ident="S02">
  <sectionmetadata/>
  <sectionobjectives view="Candidate">
    <material>
      <mattext>To assess your knowledge of the rivers in Europe.</mattext>
    </material>
  </sectionobjectives>
  <sectionobjectives view="Assessor">
    <material>
      <mattext>
        Questions on the rivers in Germany, Spain, Italy and France.
      </mattext>
    </material>
  </sectionobjectives>
  <item title="Rivers in France question" ident="I02">
    <itemrubric view="Candidate">
      <material>
        <mattext>Choose all of the correct answers.</mattext>
      </material>
    </itemrubric>
    <presentation label="Resp002">

```

```

<response_lid ident="LID02" rcardinality="Multiple">
  <material>
    <mattext>Which rivers are in France ?</mattext>
  </material>
  <render_choice shuffle="Yes" minnumber="1" maxnumber="2">
    <response_label ident="LID02_A">
      <material>
        <mattext>Seine</mattext>
      </material>
    </response_label>
    <response_label ident="LID02_B">
      <material>
        <mattext>Thames</mattext>
      </material>
    </response_label>
    <response_label ident="LID02_C">
      <material>
        <mattext>Danube</mattext>
      </material>
    </response_label>
    <response_label ident="LID02_D">
      <material>
        <mattext>Loire</mattext>
      </material>
    </response_label>
  </render_choice>
</response_lid>
</presentation>
</item>
<item title="Rivers in Germany" ident="I03"/>
  <duration> 0000:00:02:T00:59:00 </duration>
  <itemrubic view="Candidate">
    <material>
      <mattext>Choose all of the correct answers.</mattext>
    </material>
  </itemrubic>
  <presentation label="Resp003">
    <response_lid ident="LID03" rcardinality="Multiple">
      <material>
        <matimage imagetype="image/jpeg" uri="eurorivers.jpg"></matimage>
        <mattext>Which rivers are in Germany ?</mattext>
      </material>
      <render_hotspot x0="500" y0="500" height="200" width="200">
        <response_label ident="LID03_A" rarea="Ellipse"> 10,10,2,2
        </response_label>
        <response_label ident="LID03_B" rarea="Ellipse"> 15,15,2,2
        </response_label>
        <response_label ident="LID03_C" rarea="Ellipse"> 30,30,2,2
        </response_label>
        <response_label ident="LID03_D" rarea="Ellipse"> 60,60,2,2
        </response_label>
        <response_label ident="LID03_E" rarea="Ellipse"> 70,70,2,2
        </response_label>
      </render_hotspot>
    </response_lid>
  </presentation>
</item>
</section>
</questestinterop>

```

### 4.3 Assessment Schema Example

The following example consists of one Assessment with two Sections. One Section contains two Items and the other contains one Item.

```
<?xml version="1.0"?>
<!doctype questestinterop "IMS_QTIv1p0.dtd">
<questestinterop>
  <assessment title="European Geography" ident="A01">
    <qticomment>
      A Complex Assessment example.
    </qticomment>
    <assessmentmetadata/>
    <objectives view="Candidate">
      <material>
        <mattext>To test your knowledge of European geography.</mattext>
      </material>
    </objectives>
    <objectives view="Assessor">
      <material>
        <mattext>Tests the candidate's knowledge of European geography.</mattext>
      </material>
    </objectives>
    <assessprocessing>
      <qticomment>
        Processing of the final accumulated assessment.
      </qticomment>
      <scores>
        <decvar varname="TOTAL_SCORE" vartype="Integer" minvalue="10"/>
      </scores>
      <scorecondition>
        <conditionvar>
          <varlte respident="TOTAL_SCORE">50</varlte>
        </conditionvar>
        <displayfeedback feedbacktype="Response" linkrefid="A01_FDB01"/>
      </scorecondition>
      <scorecondition>
        <conditionvar>
          <vargt respident="TOTAL_SCORE">50</vargt>
        </conditionvar>
        <displayfeedback feedbacktype="Response" linkrefid="A01_FDB02"/>
      </scorecondition>
    </assessprocessing>
    <assessfeedback title="Failed" ident="A01_FDB01">
      <material>
        <mattext>You failed the test.</mattext>
      </material>
    </assessfeedback>
    <assessfeedback title="Passed" ident="A01_FDB02">
      <material>
        <mattext>You passed the test.</mattext>
      </material>
    </assessfeedback>
    <section title="European Capitals" ident="S01">
      <sectionmetadata/>
      <objectives view="Candidate">
        <material>
          <mattext>To assess your knowledge of the capital cities in Europe.
        </mattext>
        </material>
      </objectives>
      <objectives view="Tutor">
        <material>
          <mattext>
            To ensure that the student knows the difference between the Capital cities
            of France, UK, Germany, Spain and Italy.
          </mattext>
        </material>
      </objectives>
    </section>
  </assessment>
</questestinterop>
```



```

</objectives>
<item title="Capital of France" ident="I01" maxattempts="6">
  <qticomment>
    This Item is the first example to be used in the QTI XML Binding Base
    Document.
  </qticomment>
  <itemmetadata/>
  <itemrubic view="Candidate">
    <material>
      <mattext>Choose only one of the choices available.</mattext>
    </material>
  </itemrubic>
  <presentation label="Resp001">
    <response_lid ident="LID01">
      <material>
        <mattext>What is the Capital of France ?</MATTEXT>
      </material>
      <render_choice shuffle="Yes">
        <response_label ident="LID01_A">
          <material>
            <mattext>London</mattext>
          </material>
        </response_label>
        <response_label ident="LID01_B">
          <material>
            <mattext>Paris</mattext>
          </material>
        </response_label>
        <response_label ident="LID01_C">
          <material>
            <mattext>Washington</mattext>
          </material>
        </response_label>
        <response_label ident="LID01_D" rshuffle="No">
          <material>
            <mattext>Berlin</mattext>
          </material>
        </response_label>
      </render_choice>
    </response_lid>
  </presentation>
  <resprocessing>
    <qticomment />
    <outcomes>
      <decvar vartype="Integer" defaultval="0"/>
    </outcomes>
    <respcndition>
      <qticomment> Scoring for the correct answer. </qticomment>
      <conditionvar>
        <varequal respident="LID01">LID01_B</varequal>
      </conditionvar>
      <setvar action="Set" varname="SCORE"> 10 </setvar>
      <displayfeedback feedbacktype="Response" linkrefid="I01_IFBK01"/>
    </respcndition>
  </resprocessing>
  <itemfeedback title="Correct answer" ident="I01_IFBK01">
    <material>
      <mattext>Correct answer.</mattext>
    </material>
  </itemfeedback>
  <itemfeedback ident="I01_IFBK02">
    <solution>
      <solutionmaterial>
        <material>
          <mattext>
            London is the Capital of England.
            Paris is the Capital of France.
            Washington is in the USA.
            Berlin is the Capital of Germany.
          </mattext>
        </material>
      </solutionmaterial>
    </solution>
  </itemfeedback>

```

```

        </solutionmaterial>
    </solution>
</itemfeedback>
<itemfeedback ident="I01_IFBK03" view="All">
    <hint feedbackstyle="Multilevel">
        <hintmaterial>
            <material>
                <mattext>One of the choices is not in Europe.</mattext>
            </material>
        </hintmaterial>
        <hintmaterial>
            <material>
                <mattext>Berlin is the Capital of Germany.</mattext>
            </material>
        </hintmaterial>
        <hintmaterial>
            <material>
                <mattext>The Eiffel tower is in the Capital of France.</mattext>
            </material>
        </hintmaterial>
    </hint>
</itemfeedback>
</item>
</section>
<section title="European Rivers" ident="S02">
    <sectionmetadata/>
    <objectives view="Candidate">
        <material>
            <mattext>To assess your knowledge of the rivers in Europe.</mattext>
        </material>
    </objectives>
    <objectives view="Assessor">
        <material>
            <mattext>Questions on rivers in Germany, Spain, Italy and France.
            </mattext>
        </material>
    </objectives>
    <item title="Rivers in France question" ident="I02">
        <itemrubric view="Candidate">
            <material>
                <mattext>Choose all of the correct answers.</mattext>
            </material>
        </itemrubric>
        <presentation label="Resp002">
            <response_lid ident="LID02" rcardinality="Multiple">
                <material><mattext>Which rivers are in France ?</mattext>
                </material>
                <render_choice shuffle="Yes" minnumber="1" maxnumber="2">
                    <response_label ident="LID02_A">
                        <material><mattext>Seine</mattext>
                        </material>
                    </response_label>
                    <response_label ident="LID02_B">
                        <material><mattext>Thames</mattext>
                        </material>
                    </response_label>
                    <response_label ident="LID02_C">
                        <material><mattext>Danube</mattext>
                        </material>
                    </response_label>
                    <response_label ident="LID02_D">
                        <material>
                            <mattext>Loire</mattext>
                        </material>
                    </response_label>
                </render_choice>
            </response_lid>
        </presentation>
    </item>
    <item title="Rivers in Germany" ident="I03"/>
    <duration> 0000:00:02:T00:59:00 </duration>

```

```
<itemrubic view="Candidate">
  <material>
    <mattext>Choose all of the correct answers.</mattext>
  </material>
</itemrubic>
<presentation label="Resp003">
  <response_lid ident="LID03" rcardinality="Multiple">
    <material>
      <matimage imagetype="image/jpeg" uri="eurorivers.jpg"></matimage>
      <mattext>Which rivers are in Germany ?</mattext>
    </material>
    <render_hotspot x0="500" y0="500" height="200">
      <response_label ident="LID03_A" rarea="Ellipse"> 10,10,2,2
    </response_label>
      <response_label ident="LID03_B" rarea="Ellipse"> 15,15,2,2
    </response_label>
      <response_label ident="LID03_C" rarea="Ellipse"> 30,30,2,2
    </response_label>
      <response_label ident="LID03_D" rarea="Ellipse"> 60,60,2,2
    </response_label>
      <response_label ident="LID03_E" rarea="Ellipse"> 70,70,2,2
    </response_label>
    </render_hotspot>
  </response_lid>
</presentation>
</item>
</section>
</assessment>
</questestinterop>
```

## 5. Meta-data Schema

The following meta-data elements are unique to the IMS Q&TI specifications. The elements declared within the IMS Meta-data Specifications are to be included where appropriate using whatever approach is suitable to the particular implementation. The issue of meta-data harmonisation with the other IMS specifications will be addressed in V2.0 of the IMS QTI Specifications.

### 5.1 Assessment Meta-data

```
<!ELEMENT assessmentmetadata (
    qmd_absolutescore?,
    qmd_assessmenttype?,
    qmd_feedbackavailable?,
    qmd_hintsavailable?,
    qmd_scoretype,
    qmd_solutionsavailable?,
    qmd_sectionselection?,
    qmd_sectionsequence?,
    qmd_itemselection?,
    qmd_itemsequence?,
    qmd_timelimit?,
    qmd_toolvendor?,
    qmd_material*)>
```

### 5.2 Section Meta-data

```
<!ELEMENT sectionmetadata (
    qmd_numberofitems?,
    qmd_sectionsincluded,
    qmd_timelimit?,
    qmd_sectionselection?,
    qmd_sectionsequence?,
    qmd_itemselection?,
    qmd_itemsequence?,
    qmd_material*)>
```

## 5.3 Item Meta-data

```
<!ELEMENT itemmetadata (  
    qmd_computerscored?,  
    qmd_feedbackavailable?,  
    qmd_hintsavailable?,  
    qmd_itemtype,  
    qmd_levelofdifficulty?,  
    qmd_maximumscore,  
    qmd_renderingtype+,  
    qmd_responsetype+,  
    qmd_scoringavailable?,  
    qmd_solutionpermitted?,  
    qmd_status?,  
    qmd_timedependence?,  
    qmd_timelimit?,  
    qmd_toolvendor?,  
    qmd_topic?,  
    qmd_typeofsolution?,  
    qmd_weighting?,  
    qmd_material*)>
```

## Appendix A - QTI DTD

```

<!ELEMENT questestinterop (qticomment? , (assessment | section | item )+ )>
<!ENTITY % I_Title " title CDATA #IMPLIED">
<!ENTITY % I_Label " label CDATA #IMPLIED">
<!ENTITY % I_Ident " ident CDATA #REQUIRED">
<!ENTITY % I_View " view ( All |
                        Administrator |
                        AdminAuthority |
                        Assessor |
                        Author |
                        Candidate |
                        InvigilatorProctor |
                        Psychometrician |
                        Scorer |
                        Tutor ) 'All' ">
<!ENTITY % I_FeedbackSwitch " feedbackswitch (Yes | No ) 'Yes' ">
<!ENTITY % I_HintSwitch " hintswitch (Yes | No ) 'Yes' ">
<!ENTITY % I_SolutionSwitch " solutionswitch (Yes | No ) 'Yes' ">
<!ENTITY % I_Rcardinality " rcardinality (Single | Multiple | Ordered ) 'Single' ">
<!ENTITY % I_Rtiming " rtiming (Yes | No ) 'No' ">
<!ENTITY % I_Uri " uri CDATA #IMPLIED">
<!ENTITY % I_X0 " x0 CDATA #IMPLIED">
<!ENTITY % I_Y0 " y0 CDATA #IMPLIED">
<!ENTITY % I_Height " height CDATA #IMPLIED">
<!ENTITY % I_Width " width CDATA #IMPLIED">
<!ENTITY % I_Embedded " embedded CDATA 'base64' ">
<!ENTITY % I_LinkRefId " linkrefid CDATA #REQUIRED">
<!ENTITY % I_VarName " varname CDATA 'SCORE' ">
<!ENTITY % I_RespIdent " respident CDATA #REQUIRED">
<!ENTITY % I_Continue " continue (Yes | No ) 'No' ">
<!ENTITY % I_CharSet " charset CDATA 'ascii-us' ">
<!ENTITY % I_ScoreModel " scoremodel CDATA 'SumofScores' ">
<!ENTITY % I_MinNumber " minnumber CDATA #IMPLIED">
<!ENTITY % I_MaxNumber " maxnumber CDATA #IMPLIED">
<!ENTITY % I_FeedbackStyle " feedbackstyle (Complete | Incremental | Multilevel | Proprietary )
    'Complete' ">
<!ENTITY % I_Case " case (Yes | No ) 'No' ">
<!ELEMENT qmd_absolutescore (#PCDATA )>

```

```

<!ELEMENT qmd_assessmenttype (#PCDATA )>
<!ELEMENT qmd_computerscored (#PCDATA )>
<!ELEMENT qmd_feedbackavailable (#PCDATA )>
<!ELEMENT qmd_hintsavailable (#PCDATA )>
<!ELEMENT qmd_itemtype (#PCDATA )>
<!ELEMENT qmd_maximumscore (#PCDATA )>
<!ELEMENT qmd_numberofitems (#PCDATA )>
<!ELEMENT qmd_renderingtype (#PCDATA )>
<!ELEMENT qmd_responsetype (#PCDATA )>
<!ELEMENT qmd_scoringavailable (#PCDATA )>
<!ELEMENT qmd_scoretype (#PCDATA )>
<!ELEMENT qmd_sectionsincluded (#PCDATA )>
<!ELEMENT qmd_solutionsavailable (#PCDATA )>
<!ELEMENT qmd_sectionselection (#PCDATA )>
<!ELEMENT qmd_sectionsequence (#PCDATA )>
<!ELEMENT qmd_itemselection (#PCDATA )>
<!ELEMENT qmd_itemsequence (#PCDATA )>
<!ELEMENT qmd_status (#PCDATA )>
<!ELEMENT qmd_timedependence (#PCDATA )>
<!ELEMENT qmd_timelimit (#PCDATA )>
<!ELEMENT qmd_toolvendor (#PCDATA )>
<!ELEMENT qmd_topic (#PCDATA )>
<!ELEMENT qmd_material (#PCDATA )>
<!ELEMENT qmd_typeofsolution (#PCDATA )>
<!ELEMENT qmd_levelofdifficulty (#PCDATA )>
<!ELEMENT qmd_weighting (#PCDATA )>
<!ELEMENT qticomment (#PCDATA )>
<!ATTLIST qticomment e-dtype NMTOKEN #FIXED 'string' >
<!ELEMENT material (qticomment? , (mattext | matimage | mataudio | matvideo | matapplet |
    matapplication | matref | mat_extension )+ , altmaterial? )>
<!ATTLIST material %I_Label; >
<!ELEMENT mattext (#PCDATA )>
<!ATTLIST mattext texttype CDATA 'text/plain'
    %I_Label;
    %I_CharSet;
    %I_Uri; >
<!ELEMENT matimage (#PCDATA )>
<!ATTLIST matimage imagetype CDATA 'image/jpeg'
    %I_Label;
    %I_Height;
    %I_Uri;
    %I_Embedded;

```

```

        %I_Width;
        %I_Y0;
        %I_X0; >

<!ELEMENT mataudio (#PCDATA )>
<!ATTLIST mataudio audiotype CDATA 'audio/base'
        %I_Label;
        %I_Uri;
        %I_Embedded; >

<!ELEMENT matvideo (#PCDATA )>
<!ATTLIST matvideo videotype CDATA 'video/avi'
        %I_Label;
        %I_Uri;
        %I_Width;
        %I_Height;
        %I_Y0;
        %I_X0;
        %I_Embedded; >

<!ELEMENT matapplet (#PCDATA )>
<!ATTLIST matapplet %I_Label;
        %I_Uri;
        %I_Y0;
        %I_Height;
        %I_Width;
        %I_X0;
        %I_Embedded; >

<!ELEMENT matapplication (#PCDATA )>
<!ATTLIST matapplication apptype CDATA #IMPLIED
        %I_Label;
        %I_Uri;
        %I_Embedded; >

<!ELEMENT matref (#PCDATA )>
<!ATTLIST matref %I_LinkRefId; >

<!ELEMENT altmaterial (qticomment? , (matttext | matimage | mataudio | matvideo | matapplet |
        matapplication | matref | mat_extension )+ )>

<!ELEMENT decvar (#PCDATA )>
<!ATTLIST decvar %I_VarName;
        vartype (Integer |
                String |
                Decimal |
                Scientific |
                Boolean |
                Enumerated |
                Set ) 'Integer'
        defaultval CDATA #IMPLIED
        minvalue CDATA #IMPLIED
        maxvalue CDATA #IMPLIED
        members CDATA #IMPLIED >

<!ELEMENT setvar (#PCDATA )>
<!ATTLIST setvar %I_VarName;
        action (Set |
                Add |
                Subtract |
                Multiply |
                Divide ) 'Set' >

<!ELEMENT interpretvar (material )>
<!ATTLIST interpretvar %I_View;
        %I_VarName; >

<!ELEMENT conditionvar (not | and | or | unanswered | other | varequal | varlt | varlte | vargt
        | vargte | varsubset | varinside | durequal | durlt | durlte | durgt | durgte |
        var_extension )+>

```



```

<!ELEMENT not (and | or | unanswered | other | varequal | varlt | varlte | vargt | vargte |
  varsubset | varinside | durequal | durlt | durlte | durgt | durgte )>

<!ELEMENT and (not | and | or | unanswered | other | varequal | varlt | varlte | vargt | vargte
  | varsubset | varinside | durequal | durlt | durlte | durgt | durgte )+>

<!ELEMENT or (not | and | or | unanswered | other | varequal | varlt | varlte | vargt | vargte |
  varsubset | varinside | durequal | durlt | durlte | durgt | durgte )+>

<!ELEMENT varequal (#PCDATA )>
<!ATTLIST varequal %I_Case;
  %I_RespIdent; >

<!ELEMENT varlt (#PCDATA )>
<!ATTLIST varlt %I_RespIdent; >

<!ELEMENT varlte (#PCDATA )>
<!ATTLIST varlte %I_RespIdent; >

<!ELEMENT vargt (#PCDATA )>
<!ATTLIST vargt %I_RespIdent; >

<!ELEMENT vargte (#PCDATA )>
<!ATTLIST vargte %I_RespIdent; >

<!ELEMENT varsubset (#PCDATA )>
<!ATTLIST varsubset %I_Case;
  %I_RespIdent;
  setmatch (Exact | Partial ) 'Exact' >

<!ELEMENT varinside (#PCDATA )>
<!ATTLIST varinside areatype (Ellipse | Rectangle | Bounded ) #REQUIRED
  %I_RespIdent; >

<!ELEMENT durequal (#PCDATA )>

<!ELEMENT durlt (#PCDATA )>

<!ELEMENT durlte (#PCDATA )>

<!ELEMENT durgt (#PCDATA )>

<!ELEMENT durgte (#PCDATA )>

<!ELEMENT unanswered (#PCDATA )>
<!ATTLIST unanswered %I_RespIdent; >

<!ELEMENT other (#PCDATA )>

<!ELEMENT duration (#PCDATA )>

<!ELEMENT displayfeedback (#PCDATA )>
<!ATTLIST displayfeedback feedbacktype (Response | Solution | Hint ) 'Response'
  %I_LinkRefId; >

<!ELEMENT scorecondition (qticomment? , conditionvar , setvar* , displayfeedback* ,
  scorecondition_extension? )>
<!ATTLIST scorecondition %I_Title;
  %I_Continue; >

<!ELEMENT scores (qticomment? , (decvar | interpretvar )+ )>

<!ELEMENT objectives (qticomment? , material )>
<!ATTLIST objectives %I_View; >

<!ELEMENT mat_extension ANY>

<!ELEMENT var_extension ANY>

<!ELEMENT response_extension ANY>

<!ELEMENT render_extension ANY>

```

```

<!ELEMENT assessproc_extension ANY>

<!ELEMENT sectionproc_extension ANY>

<!ELEMENT itemproc_extension ANY>

<!ELEMENT respcnd_extension ANY>

<!ELEMENT scorecondition_extension ANY>

<!ELEMENT condition_extension ANY>

<!ELEMENT assessment (qticomment? , duration? , assessmentmetadata? , objectives* ,
  assessmentcontrol* , assessprocessing? , assessproc_extension? , assessfeedback* ,
  (sectionref | section)+ , sectionselection* , sectionsequence* )>
<!ATTLIST assessment %I_Ident;
  %I_Title; >

<!ELEMENT assessmentmetadata (qmd_absolutescore? , qmd_assessmenttype? , qmd_feedbackavailable?
  , qmd_hintsavailable? , qmd_scoretype , qmd_solutionsavailable? , qmd_sectionselection? ,
  qmd_sectionsequence? , qmd_itemselection? , qmd_itemsequence? , qmd_timelimit? ,
  qmd_toolvendor? , qmd_material* )>

<!ELEMENT assessmentcontrol (qticomment? )>
<!ATTLIST assessmentcontrol %I_HintSwitch;
  %I_SolutionSwitch;
  %I_View;
  %I_FeedbackSwitch; >

<!ELEMENT assessprocessing (qticomment? , scores , scorecondition* , condition_extension? )>
<!ATTLIST assessprocessing %I_ScoreModel; >

<!ELEMENT assessfeedback (qticomment? , material? )>
<!ATTLIST assessfeedback %I_View;
  %I_Ident;
  %I_Title; >

<!ELEMENT sectionref (#PCDATA )>
<!ATTLIST sectionref %I_LinkRefId; >

<!ELEMENT sectionselection (#PCDATA )>

<!ELEMENT sectionsequence (#PCDATA )>

<!ELEMENT section (qticomment? , duration? , sectionmetadata? , sectionprecondition* ,
  sectionpostcondition* , objectives* , sectioncontrol* , (sectionref | section)* ,
  sectionselection* , sectionsequence* , sectionprocessing? , sectionproc_extension? ,
  sectionfeedback* , (itemref | item)* , itemselection* , itemsequence* )>
<!ATTLIST section %I_Ident;
  %I_Title; >

<!ELEMENT sectionmetadata (qmd_numberofitems , qmd_sectionsincluded , qmd_sectionselection? ,
  qmd_sectionsequence? , qmd_itemselection? , qmd_itemsequence? , qmd_timelimit? ,
  qmd_material* )>

<!ELEMENT sectionprecondition (#PCDATA )>

<!ELEMENT sectionpostcondition (#PCDATA )>

<!ELEMENT sectioncontrol (qticomment? )>
<!ATTLIST sectioncontrol %I_FeedbackSwitch;
  %I_HintSwitch;
  %I_SolutionSwitch;
  %I_View; >

<!ELEMENT itemref (#PCDATA )>
<!ATTLIST itemref %I_LinkRefId; >

<!ELEMENT itemselection (#PCDATA )>

<!ELEMENT itemsequence (#PCDATA )>

```

```

<!ELEMENT sectionprocessing (qticomment? , scores , scorecondition+ , condition_extension )>
<!ATTLIST sectionprocessing %I_ScoreModel; >

<!ELEMENT sectionfeedback (qticomment? , material )>
<!ATTLIST sectionfeedback %I_View;
                        %I_Ident;
                        %I_Title; >

<!ELEMENT item (qticomment? , duration? , itemmetadata? , objectives* , itemcontrol* ,
               itemprecondition* , itempostcondition* , itemrubric* , presentation? , resprocessing* ,
               itemproc_extension? , itemfeedback* )>
<!ATTLIST item maxattempts CDATA #IMPLIED
               %I_Label;
               %I_Ident;
               %I_Title; >

<!ELEMENT itemmetadata (qmd_computerscored? , qmd_feedbackavailable? , qmd_hintsavailable? ,
                       qmd_itemtype , qmd_levelofdifficulty? , qmd_maximumscore , qmd_renderingtype+ ,
                       qmd_responsetype+ , qmd_scoringavailable? , qmd_solutionsavailable? , qmd_status? ,
                       qmd_timedependence? , qmd_timelimit? , qmd_toolvendor? , qmd_topic? , qmd_material* ,
                       qmd_typeofsolution? , qmd_weighting? )>

<!ELEMENT itemobjectives (qticomment? , material )>
<!ATTLIST itemobjectives %I_View; >

<!ELEMENT itemcontrol (qticomment? )>
<!ATTLIST itemcontrol %I_FeedbackSwitch;
                     %I_HintSwitch;
                     %I_SolutionSwitch;
                     %I_View; >

<!ELEMENT itemprecondition (#PCDATA )>

<!ELEMENT itempostcondition (#PCDATA )>

<!ELEMENT itemrubric (material )>
<!ATTLIST itemrubric %I_View; >

<!ELEMENT presentation (qticomment? , material* , ( (response_lid | response_xy | response_str
           | response_num | response_grp | response_extension ) , material* )+ )>
<!ATTLIST presentation %I_Label; >

<!ELEMENT response_lid (material? , (render_choice | render_hotspot | render_slider |
           render_fib | render_extension ) , material? )>
<!ATTLIST response_lid %I_Rcardinality;
                       %I_Rtiming;
                       %I_Ident; >

<!ELEMENT response_xy (material? , (render_choice | render_hotspot | render_slider | render_fib
           | render_extension ) , material? )>
<!ATTLIST response_xy %I_Rcardinality;
                       %I_Rtiming;
                       %I_Ident; >

<!ELEMENT response_str (material? , (render_choice | render_hotspot | render_slider |
           render_fib | render_extension ) , material? )>
<!ATTLIST response_str %I_Rcardinality;
                       %I_Ident;
                       %I_Rtiming; >

<!ELEMENT response_num (material? , (render_choice | render_hotspot | render_slider |
           render_fib | render_extension ) , material? )>
<!ATTLIST response_num numtype (Integer | Decimal | Scientific) 'Integer'
                       %I_Rcardinality;
                       %I_Ident;
                       %I_Rtiming; >

<!ELEMENT response_grp (material? , (render_choice | render_hotspot | render_slider |
           render_fib | render_extension ) , material? )>
<!ATTLIST response_grp %I_Rcardinality;

```

```

        %I_Ident;
        %I_Rtiming; >

<!ELEMENT response_label (#PCDATA | qticomment | material )*>
<!ATTLIST response_label rshuffle (Yes | No ) 'Yes'
        rarea (Ellipse | Rectangle | Bounded ) 'Ellipse'
        rrange (Exact | Range ) 'Exact'
        labelrefid CDATA #IMPLIED
        %I_Ident; >

<!ELEMENT response_na ANY>

<!ELEMENT render_choice ( (material | response_label )* , response_na? )>
<!ATTLIST render_choice shuffle (Yes | No ) 'No'
        %I_MinNumber;
        %I_MaxNumber; >

<!ELEMENT render_hotspot ( (material | response_label )* , response_na? )>
<!ATTLIST render_hotspot %I_MaxNumber;
        %I_MinNumber;
        showdraw (Yes | No ) 'No'>

<!ELEMENT render_slider ( (material | response_label )* , response_na? )>
<!ATTLIST render_slider orientation (Horizontal | Vertical ) 'Horizontal'
        lowerbound CDATA #REQUIRED
        upperbound CDATA #REQUIRED
        step CDATA #IMPLIED
        startval CDATA #IMPLIED
        steplabel (Yes | No ) 'No'
        %I_MaxNumber;
        %I_MinNumber; >

<!ELEMENT render_fib ( (material | response_label )* , response_na? )>
<!ATTLIST render_fib encoding CDATA 'UTF_8'
        fibtype (String | Integer | Decimal | Scientific ) 'String'
        rows CDATA #IMPLIED
        maxchars CDATA #IMPLIED
        prompt (Box | Dashline | Asterisk | Underline ) #IMPLIED
        columns CDATA #IMPLIED
        %I_CharSet;
        %I_MaxNumber;
        %I_MinNumber;
        a-dtype NMTOKENS 'rows int
        maxchars int
        columns int' >

<!ELEMENT resprocessing (qticomment? , outcomes , (rescondition | itemproc_extension)+ )>
<!ATTLIST resprocessing %I_ScoreModel; >

<!ELEMENT outcomes (qticomment? , (decvar | interpretvar )+ )>

<!ELEMENT rescondition (qticomment? , conditionvar , setvar* , displayfeedback* ,
        rescond_extension? )>
<!ATTLIST rescondition %I_Continue;
        %I_Title; >

<!ELEMENT itemfeedback (material | solution+ | hint+ )>
<!ATTLIST itemfeedback %I_View;
        %I_Ident;
        %I_Title; >

<!ELEMENT solution (qticomment? , solutionmaterial+ )>
<!ATTLIST solution %I_FeedbackStyle; >

<!ELEMENT solutionmaterial (material )>

<!ELEMENT hint (qticomment? , hintmaterial+ )>
<!ATTLIST hint %I_FeedbackStyle; >

<!ELEMENT hintmaterial (material )>

```

## Appendix B - QTI XDR

```

<?xml version = "1.0"?>
<!--Generated by XML Authority. Conforms to XML Data subset for IE 5-->
<Schema name = "IMS_QTIv1p0b.xdr"
  xmlns = "urn:schemas-microsoft-com:xml-data"
  xmlns:dt = "urn:schemas-microsoft-com:datatypes">
  <ElementType name = "questestinterop" content = "eltOnly" order = "seq">
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <group order = "one" minOccurs = "1" maxOccurs = "*">
      <element type = "assessment"/>
      <element type = "section"/>
      <element type = "item"/>
    </group>
  </ElementType>

  <ElementType name = "qmd_absolutescore" content = "textOnly"/>
  <ElementType name = "qmd_assessmenttype" content = "textOnly"/>
  <ElementType name = "qmd_computerscored" content = "textOnly"/>
  <ElementType name = "qmd_feedbackavailable" content = "textOnly"/>
  <ElementType name = "qmd_hintsavailable" content = "textOnly"/>
  <ElementType name = "qmd_itemtype" content = "textOnly"/>
  <ElementType name = "qmd_maximumscore" content = "textOnly"/>
  <ElementType name = "qmd_numberofitems" content = "textOnly"/>
  <ElementType name = "qmd_renderingtype" content = "textOnly"/>
  <ElementType name = "qmd_responsetype" content = "textOnly"/>
  <ElementType name = "qmd_scoringavailable" content = "textOnly"/>
  <ElementType name = "qmd_scoretype" content = "textOnly"/>
  <ElementType name = "qmd_sectionsincluded" content = "textOnly"/>
  <ElementType name = "qmd_solutionsavailable" content = "textOnly"/>
  <ElementType name = "qmd_sectionselection" content = "textOnly"/>
  <ElementType name = "qmd_sectionsequence" content = "textOnly"/>
  <ElementType name = "qmd_itemsselection" content = "textOnly"/>
  <ElementType name = "qmd_itemsequence" content = "textOnly"/>
  <ElementType name = "qmd_status" content = "textOnly"/>
  <ElementType name = "qmd_timedependence" content = "textOnly"/>
  <ElementType name = "qmd_timelimit" content = "textOnly"/>
  <ElementType name = "qmd_toolvendor" content = "textOnly"/>
  <ElementType name = "qmd_topic" content = "textOnly"/>
  <ElementType name = "qmd_material" content = "textOnly"/>
  <ElementType name = "qmd_typeofsolution" content = "textOnly"/>
  <ElementType name = "qmd_levelofdifficulty" content = "textOnly"/>
  <ElementType name = "qmd_weighting" content = "textOnly"/>

  <ElementType name = "qticomment" content = "textOnly" dt:type = "string"/>

  <ElementType name = "material" content = "eltOnly" order = "seq">
    <AttributeType name = "label" dt:type = "string"/>
    <attribute type = "label"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <group order = "one" minOccurs = "1" maxOccurs = "*">
      <element type = "mattext"/>
      <element type = "matimage"/>
      <element type = "mataudio"/>
      <element type = "matvideo"/>
      <element type = "matapplet"/>
      <element type = "matapplication"/>
      <element type = "matref"/>
      <element type = "mat_extension"/>
    </group>
    <element type = "altmaterial" minOccurs = "0" maxOccurs = "1"/>
  </ElementType>

  <ElementType name = "mattext" content = "textOnly">
    <AttributeType name = "texttype" dt:type = "string" default = "text/plain"/>
    <AttributeType name = "label" dt:type = "string"/>
    <AttributeType name = "charset" dt:type = "string" default = "ascii-us"/>
    <AttributeType name = "uri" dt:type = "string"/>

```

```

    <attribute type = "texttype"/>
    <attribute type = "label"/>
    <attribute type = "charset"/>
    <attribute type = "uri"/>
</ElementType>

<ElementType name = "matimage" content = "textOnly">
  <AttributeType name = "imagetype" dt:type = "string" default = "image/jpeg"/>
  <AttributeType name = "label" dt:type = "string"/>
  <AttributeType name = "height" dt:type = "string"/>
  <AttributeType name = "uri" dt:type = "string"/>
  <AttributeType name = "embedded" dt:type = "string" default = "base64"/>
  <AttributeType name = "width" dt:type = "string"/>
  <AttributeType name = "y0" dt:type = "string"/>
  <AttributeType name = "x0" dt:type = "string"/>
  <attribute type = "imagetype"/>
  <attribute type = "label"/>
  <attribute type = "height"/>
  <attribute type = "uri"/>
  <attribute type = "embedded"/>
  <attribute type = "width"/>
  <attribute type = "y0"/>
  <attribute type = "x0"/>
</ElementType>

<ElementType name = "mataudio" content = "textOnly">
  <AttributeType name = "audiotype" dt:type = "string" default = "audio/base"/>
  <AttributeType name = "label" dt:type = "string"/>
  <AttributeType name = "uri" dt:type = "string"/>
  <AttributeType name = "embedded" dt:type = "string" default = "base64"/>
  <attribute type = "audiotype"/>
  <attribute type = "label"/>
  <attribute type = "uri"/>
  <attribute type = "embedded"/>
</ElementType>

<ElementType name = "matvideo" content = "textOnly">
  <AttributeType name = "videotype" dt:type = "string" default = "video/avi"/>
  <AttributeType name = "label" dt:type = "string"/>
  <AttributeType name = "uri" dt:type = "string"/>
  <AttributeType name = "width" dt:type = "string"/>
  <AttributeType name = "height" dt:type = "string"/>
  <AttributeType name = "y0" dt:type = "string"/>
  <AttributeType name = "x0" dt:type = "string"/>
  <AttributeType name = "embedded" dt:type = "string" default = "base64"/>
  <attribute type = "videotype"/>
  <attribute type = "label"/>
  <attribute type = "uri"/>
  <attribute type = "width"/>
  <attribute type = "height"/>
  <attribute type = "y0"/>
  <attribute type = "x0"/>
  <attribute type = "embedded"/>
</ElementType>

<ElementType name = "matapplet" content = "textOnly">
  <AttributeType name = "label" dt:type = "string"/>
  <AttributeType name = "uri" dt:type = "string"/>
  <AttributeType name = "y0" dt:type = "string"/>
  <AttributeType name = "height" dt:type = "string"/>
  <AttributeType name = "width" dt:type = "string"/>
  <AttributeType name = "x0" dt:type = "string"/>
  <AttributeType name = "embedded" dt:type = "string" default = "base64"/>
  <attribute type = "label"/>
  <attribute type = "uri"/>
  <attribute type = "y0"/>
  <attribute type = "height"/>
  <attribute type = "width"/>
  <attribute type = "x0"/>
  <attribute type = "embedded"/>
</ElementType>

```

```

<ElementType name = "matapplication" content = "textOnly">
  <AttributeType name = "apptype" dt:type = "string"/>
  <AttributeType name = "label" dt:type = "string"/>
  <AttributeType name = "uri" dt:type = "string"/>
  <AttributeType name = "embedded" dt:type = "string" default = "base64"/>
  <attribute type = "apptype"/>
  <attribute type = "label"/>
  <attribute type = "uri"/>
  <attribute type = "embedded"/>
</ElementType>

<ElementType name = "matref" content = "textOnly">
  <AttributeType name = "linkrefid" dt:type = "string" required = "yes"/>
  <attribute type = "linkrefid"/>
</ElementType>

<ElementType name = "altmaterial" content = "eltOnly" order = "seq">
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one" minOccurs = "1" maxOccurs = "*">
    <element type = "mattext"/>
    <element type = "matimage"/>
    <element type = "mataudio"/>
    <element type = "matvideo"/>
    <element type = "matapplet"/>
    <element type = "matapplication"/>
    <element type = "matref"/>
    <element type = "mat_extension"/>
  </group>
</ElementType>

<ElementType name = "decvar" content = "textOnly">
  <AttributeType name = "varname" dt:type = "string" default = "SCORE"/>
  <AttributeType name = "vartype" dt:type = "enumeration" dt:values = "Integer
  String Decimal Scientific Boolean Enumerated Set" default = "Integer"/>
  <AttributeType name = "defaultval" dt:type = "string"/>
  <AttributeType name = "minvalue" dt:type = "string"/>
  <AttributeType name = "maxvalue" dt:type = "string"/>
  <AttributeType name = "members" dt:type = "string"/>
  <attribute type = "varname"/>
  <attribute type = "vartype"/>
  <attribute type = "defaultval"/>
  <attribute type = "minvalue"/>
  <attribute type = "maxvalue"/>
  <attribute type = "members"/>
</ElementType>

<ElementType name = "setvar" content = "textOnly">
  <AttributeType name = "varname" dt:type = "string" default = "SCORE"/>
  <AttributeType name = "action" dt:type = "enumeration" dt:values = "Set Add
  Subtract Multiply Divide" default = "Set"/>
  <attribute type = "varname"/>
  <attribute type = "action"/>
</ElementType>

<ElementType name = "interpretvar" content = "eltOnly" order = "seq">
  <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
  Administrator AdminAuthority Assessor Author Candidate
  InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <AttributeType name = "varname" dt:type = "string" default = "SCORE"/>
  <attribute type = "view"/>
  <attribute type = "varname"/>
  <element type = "material"/>
</ElementType>

<ElementType name = "conditionvar" content = "eltOnly">
  <group order = "one" minOccurs = "1" maxOccurs = "*">
    <element type = "not"/>
    <element type = "and"/>
    <element type = "or"/>
    <element type = "unanswered"/>
  </group>

```

```

        <element type = "other" />
        <element type = "varequal" />
        <element type = "varlt" />
        <element type = "varlte" />
        <element type = "vargt" />
        <element type = "vargte" />
        <element type = "varsubset" />
        <element type = "varinside" />
        <element type = "durequal" />
        <element type = "durlt" />
        <element type = "durlte" />
        <element type = "durgt" />
        <element type = "durgte" />
        <element type = "var_extension" />
    </group>
</ElementType>

<ElementType name = "not" content = "eltOnly" order = "one">
    <element type = "and" />
    <element type = "or" />
    <element type = "unanswered" />
    <element type = "other" />
    <element type = "varequal" />
    <element type = "varlt" />
    <element type = "varlte" />
    <element type = "vargt" />
    <element type = "vargte" />
    <element type = "varsubset" />
    <element type = "varinside" />
    <element type = "durequal" />
    <element type = "durlt" />
    <element type = "durlte" />
    <element type = "durgt" />
    <element type = "durgte" />
</ElementType>

<ElementType name = "and" content = "eltOnly">
    <group order = "one" minOccurs = "1" maxOccurs = "*">
        <element type = "not" />
        <element type = "and" />
        <element type = "or" />
        <element type = "unanswered" />
        <element type = "other" />
        <element type = "varequal" />
        <element type = "varlt" />
        <element type = "varlte" />
        <element type = "vargt" />
        <element type = "vargte" />
        <element type = "varsubset" />
        <element type = "varinside" />
        <element type = "durequal" />
        <element type = "durlt" />
        <element type = "durlte" />
        <element type = "durgt" />
        <element type = "durgte" />
    </group>
</ElementType>

<ElementType name = "or" content = "eltOnly">
    <group order = "one" minOccurs = "1" maxOccurs = "*">
        <element type = "not" />
        <element type = "and" />
        <element type = "or" />
        <element type = "unanswered" />
        <element type = "other" />
        <element type = "varequal" />
        <element type = "varlt" />
        <element type = "varlte" />
        <element type = "vargt" />
        <element type = "vargte" />
        <element type = "varsubset" />
    </group>
</ElementType>

```



```

        <element type = "varinside"/>
        <element type = "durequal"/>
        <element type = "durlt"/>
        <element type = "durlte"/>
        <element type = "durgt"/>
        <element type = "durgte"/>
    </group>
</ElementType>

<ElementType name = "varequal" content = "textOnly">
    <AttributeType name = "case" dt:type = "enumeration" dt:values = "Yes No"
        default = "No"/>
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "case"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "varlt" content = "textOnly">
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "varlte" content = "textOnly">
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "vargt" content = "textOnly">
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "vargte" content = "textOnly">
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "varsubset" content = "textOnly">
    <AttributeType name = "case" dt:type = "enumeration" dt:values = "Yes No" default
= "No"/>
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <AttributeType name = "setmatch" dt:type = "enumeration" dt:values = "Exact
Partial" default = "Exact"/>
    <attribute type = "case"/>
    <attribute type = "respident"/>
    <attribute type = "setmatch"/>
</ElementType>

<ElementType name = "varinside" content = "textOnly">
    <AttributeType name = "areatype" dt:type = "enumeration" dt:values = "Ellipse
Rectangle Bounded" required = "yes"/>
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "areatype"/>
    <attribute type = "respident"/>
</ElementType>

<ElementType name = "durequal" content = "textOnly"/>

<ElementType name = "durlt" content = "textOnly"/>

<ElementType name = "durlte" content = "textOnly"/>

<ElementType name = "durgt" content = "textOnly"/>

<ElementType name = "durgte" content = "textOnly"/>

<ElementType name = "unanswered" content = "textOnly">
    <AttributeType name = "respident" dt:type = "string" required = "yes"/>
    <attribute type = "respident"/>
</ElementType>

```

```

<ElementType name = "other" content = "textOnly"/>

<ElementType name = "duration" content = "textOnly"/>

<ElementType name = "displayfeedback" content = "textOnly">
  <AttributeType name = "feedbacktype" dt:type = "enumeration" dt:values =
    "Response Solution Hint" default = "Response"/>
  <AttributeType name = "linkrefid" dt:type = "string" required = "yes"/>
  <attribute type = "feedbacktype"/>
  <attribute type = "linkrefid"/>
</ElementType>

<ElementType name = "scorecondition" content = "eltOnly" order = "seq">
  <AttributeType name = "title" dt:type = "string"/>
  <AttributeType name = "continue" dt:type = "enumeration" dt:values = "Yes No"
    default = "No"/>
  <attribute type = "title"/>
  <attribute type = "continue"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <element type = "conditionvar"/>
  <element type = "setvar" minOccurs = "0" maxOccurs = "**"/>
  <element type = "displayfeedback" minOccurs = "0" maxOccurs = "**"/>
  <element type = "scorecondition_extension" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "scores" content = "eltOnly" order = "seq">
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one" minOccurs = "1" maxOccurs = "**">
    <element type = "decvar"/>
    <element type = "interpretvar"/>
  </group>
</ElementType>

<ElementType name = "objectives" content = "eltOnly" order = "seq">
  <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
    Administrator AdminAuthority Assessor Author Candidate
    InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <attribute type = "view"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <element type = "material"/>
</ElementType>

<ElementType name = "mat_extension" content = "mixed" model = "open"/>

<ElementType name = "var_extension" content = "mixed" model = "open"/>

<ElementType name = "response_extension" content = "mixed" model = "open"/>

<ElementType name = "render_extension" content = "mixed" model = "open"/>

<ElementType name = "assessproc_extension" content = "mixed" model = "open"/>

<ElementType name = "sectionproc_extension" content = "mixed" model = "open"/>

<ElementType name = "itemproc_extension" content = "mixed" model = "open"/>

<ElementType name = "respond_extension" content = "mixed" model = "open"/>

<ElementType name = "scorecondition_extension" content = "mixed" model = "open"/>

<ElementType name = "condition_extension" content = "mixed" model = "open"/>

<ElementType name = "assessment" content = "eltOnly" order = "seq">
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "title" dt:type = "string"/>
  <attribute type = "ident"/>
  <attribute type = "title"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <element type = "duration" minOccurs = "0" maxOccurs = "1"/>
  <element type = "assessmentmetadata" minOccurs = "0" maxOccurs = "1"/>
  <element type = "objectives" minOccurs = "0" maxOccurs = "**"/>

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    <element type = "assessmentcontrol" minOccurs = "0" maxOccurs = "*" />
    <element type = "assessprocessing" minOccurs = "0" maxOccurs = "1" />
    <element type = "assessproc_extension" minOccurs = "0" maxOccurs = "1" />
    <element type = "assessfeedback" minOccurs = "0" maxOccurs = "*" />
    <group order = "one" minOccurs = "1" maxOccurs = "*" >
      <element type = "sectionref" />
      <element type = "section" />
    </group>
    <element type = "sectionselection" minOccurs = "0" maxOccurs = "*" />
    <element type = "sectionsequence" minOccurs = "0" maxOccurs = "*" />
  </ElementType>

  <ElementType name = "assessmentmetadata" content = "eltOnly" order = "seq">
    <element type = "qmd_absolutescore" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_assessmenttype" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_feedbackavailable" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_hintsavailable" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_scoretype" />
    <element type = "qmd_solutionsavailable" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_sectionselection" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_sectionsequence" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_itemselection" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_itemsequence" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_timelimit" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_toolvendor" minOccurs = "0" maxOccurs = "1" />
    <element type = "qmd_material" minOccurs = "0" maxOccurs = "*" />
  </ElementType>

  <ElementType name = "assessmentcontrol" content = "eltOnly" order = "seq">
    <AttributeType name = "hintswitch" dt:type = "enumeration" dt:values = "Yes No"
      default = "Yes" />
    <AttributeType name = "solutionswitch" dt:type = "enumeration" dt:values = "Yes
      No" default = "Yes" />
    <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
      Administrator AdminAuthority Assessor Author Candidate
      InvigilatorProctor Psychometrician Scorer Tutor" default = "All" />
    <AttributeType name = "feedbackswitch" dt:type = "enumeration" dt:values = "Yes
      No" default = "Yes" />
    <attribute type = "hintswitch" />
    <attribute type = "solutionswitch" />
    <attribute type = "view" />
    <attribute type = "feedbackswitch" />
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1" />
  </ElementType>

  <ElementType name = "assessprocessing" content = "eltOnly" order = "seq">
    <AttributeType name = "scoremodel" dt:type = "string" default = "SumofScores" />
    <attribute type = "scoremodel" />
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1" />
    <element type = "scores" />
    <element type = "scorecondition" minOccurs = "0" maxOccurs = "*" />
    <element type = "condition_extension" minOccurs = "0" maxOccurs = "1" />
  </ElementType>

  <ElementType name = "assessfeedback" content = "eltOnly" order = "seq">
    <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
      Administrator AdminAuthority Assessor Author Candidate
      InvigilatorProctor Psychometrician Scorer Tutor" default = "All" />
    <AttributeType name = "ident" dt:type = "string" required = "yes" />
    <AttributeType name = "title" dt:type = "string" />
    <attribute type = "view" />
    <attribute type = "ident" />
    <attribute type = "title" />
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1" />
    <element type = "material" minOccurs = "0" maxOccurs = "1" />
  </ElementType>

  <ElementType name = "sectionref" content = "textOnly">
    <AttributeType name = "linkrefid" dt:type = "string" required = "yes" />
    <attribute type = "linkrefid" />
  </ElementType>

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<ElementType name = "sectionselection" content = "textOnly"/>
<ElementType name = "sectionsequence" content = "textOnly"/>
<ElementType name = "section" content = "eltOnly" order = "seq">
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "title" dt:type = "string"/>
  <attribute type = "ident"/>
  <attribute type = "title"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <element type = "duration" minOccurs = "0" maxOccurs = "1"/>
  <element type = "sectionmetadata" minOccurs = "0" maxOccurs = "1"/>
  <element type = "sectionprecondition" minOccurs = "0" maxOccurs = "*" />
  <element type = "sectionpostcondition" minOccurs = "0" maxOccurs = "*" />
  <element type = "objectives" minOccurs = "0" maxOccurs = "*" />
  <element type = "sectioncontrol" minOccurs = "0" maxOccurs = "*" />
  <group order = "many">
    <element type = "sectionref"/>
    <element type = "section"/>
  </group>
  <element type = "sectionselection" minOccurs = "0" maxOccurs = "*" />
  <element type = "sectionsequence" minOccurs = "0" maxOccurs = "*" />
  <element type = "sectionprocessing" minOccurs = "0" maxOccurs = "1" />
  <element type = "sectionproc_extension" minOccurs = "0" maxOccurs = "1" />
  <element type = "sectionfeedback" minOccurs = "0" maxOccurs = "*" />
  <group order = "many">
    <element type = "itemref"/>
    <element type = "item"/>
  </group>
  <element type = "itemselection" minOccurs = "0" maxOccurs = "*" />
  <element type = "itemsequence" minOccurs = "0" maxOccurs = "*" />
</ElementType>

<ElementType name = "sectionmetadata" content = "eltOnly" order = "seq">
  <element type = "qmd_numberofitems"/>
  <element type = "qmd_sectionsincluded"/>
  <element type = "qmd_sectionselection" minOccurs = "0" maxOccurs = "1"/>
  <element type = "qmd_sectionsequence" minOccurs = "0" maxOccurs = "1"/>
  <element type = "qmd_itemselection" minOccurs = "0" maxOccurs = "1"/>
  <element type = "qmd_itemsequence" minOccurs = "0" maxOccurs = "1"/>
  <element type = "qmd_timelimit" minOccurs = "0" maxOccurs = "1"/>
  <element type = "qmd_material" minOccurs = "0" maxOccurs = "*" />
</ElementType>

<ElementType name = "sectionprecondition" content = "textOnly"/>
<ElementType name = "sectionpostcondition" content = "textOnly"/>
<ElementType name = "sectioncontrol" content = "eltOnly" order = "seq">
  <AttributeType name = "feedbackswitch" dt:type = "enumeration" dt:values = "Yes
  No" default = "Yes"/>
  <AttributeType name = "hintswitch" dt:type = "enumeration" dt:values = "Yes No"
  default = "Yes"/>
  <AttributeType name = "solutionswitch" dt:type = "enumeration" dt:values = "Yes
  No" default = "Yes"/>
  <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
  Administrator AdminAuthority Assessor Author Candidate
  InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <attribute type = "feedbackswitch"/>
  <attribute type = "hintswitch"/>
  <attribute type = "solutionswitch"/>
  <attribute type = "view"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "itemref" content = "textOnly">
  <AttributeType name = "linkrefid" dt:type = "string" required = "yes"/>
  <attribute type = "linkrefid"/>
</ElementType>

<ElementType name = "itemselection" content = "textOnly"/>
<ElementType name = "itemsequence" content = "textOnly"/>
<ElementType name = "sectionprocessing" content = "eltOnly" order = "seq">
  <AttributeType name = "scoremodel" dt:type = "string" default = "SumofScores"/>

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    <attribute type = "scoremodel"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <element type = "scores"/>
    <element type = "scorecondition" minOccurs = "1" maxOccurs = "*" />
    <element type = "condition_extension"/>
  </ElementType>

  <ElementType name = "sectionfeedback" content = "eltOnly" order = "seq">
    <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
      Administrator AdminAuthority Assessor Author Candidate
      InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
    <AttributeType name = "ident" dt:type = "string" required = "yes"/>
    <AttributeType name = "title" dt:type = "string"/>
    <attribute type = "view"/>
    <attribute type = "ident"/>
    <attribute type = "title"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <element type = "material"/>
  </ElementType>

  <ElementType name = "item" content = "eltOnly" order = "seq">
    <AttributeType name = "maxattempts" dt:type = "string"/>
    <AttributeType name = "label" dt:type = "string"/>
    <AttributeType name = "ident" dt:type = "string" required = "yes"/>
    <AttributeType name = "title" dt:type = "string"/>
    <attribute type = "maxattempts"/>
    <attribute type = "label"/>
    <attribute type = "ident"/>
    <attribute type = "title"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <element type = "duration" minOccurs = "0" maxOccurs = "1"/>
    <element type = "itemmetadata" minOccurs = "0" maxOccurs = "1"/>
    <element type = "objectives" minOccurs = "0" maxOccurs = "*" />
    <element type = "itemcontrol" minOccurs = "0" maxOccurs = "*" />
    <element type = "itemprecondition" minOccurs = "0" maxOccurs = "*" />
    <element type = "itempostcondition" minOccurs = "0" maxOccurs = "*" />
    <element type = "itemrubric" minOccurs = "0" maxOccurs = "*" />
    <element type = "presentation" minOccurs = "0" maxOccurs = "1"/>
    <element type = "resprocessing" minOccurs = "0" maxOccurs = "*" />
    <element type = "itemproc_extension" minOccurs = "0" maxOccurs = "1"/>
    <element type = "itemfeedback" minOccurs = "0" maxOccurs = "*" />
  </ElementType>

  <ElementType name = "itemmetadata" content = "eltOnly" order = "seq">
    <element type = "qmd_computerscored" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_feedbackavailable" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_hintsavailable" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_itemtype"/>
    <element type = "qmd_levelofdifficulty" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_maximumscore"/>
    <element type = "qmd_renderingtype" minOccurs = "1" maxOccurs = "*" />
    <element type = "qmd_responsetype" minOccurs = "1" maxOccurs = "*" />
    <element type = "qmd_scoringavailable" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_solutionsavailable" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_status" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_timedependence" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_timelimit" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_toolvendor" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_topic" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_material" minOccurs = "0" maxOccurs = "*" />
    <element type = "qmd_typeofsolution" minOccurs = "0" maxOccurs = "1"/>
    <element type = "qmd_weighting" minOccurs = "0" maxOccurs = "1"/>
  </ElementType>

  <ElementType name = "itemobjectives" content = "eltOnly" order = "seq">
    <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
      Administrator AdminAuthority Assessor Author Candidate
      InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
    <attribute type = "view"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <element type = "material"/>
  </ElementType>

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</ElementType>

<ElementType name = "itemcontrol" content = "eltOnly" order = "seq">
  <AttributeType name = "feedbackswitch" dt:type = "enumeration" dt:values = "Yes
    No" default = "Yes"/>
  <AttributeType name = "hintswitch" dt:type = "enumeration" dt:values = "Yes No"
    default = "Yes"/>
  <AttributeType name = "solutionswitch" dt:type = "enumeration" dt:values = "Yes
    No" default = "Yes"/>
  <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
    Administrator AdminAuthority Assessor Author Candidate
    InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <attribute type = "feedbackswitch"/>
  <attribute type = "hintswitch"/>
  <attribute type = "solutionswitch"/>
  <attribute type = "view"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "itemprecondition" content = "textOnly"/>
<ElementType name = "itempostcondition" content = "textOnly"/>
<ElementType name = "itemrubric" content = "eltOnly" order = "seq">
  <AttributeType name = "view" dt:type = "enumeration" dt:values = "All
    Administrator AdminAuthority Assessor Author Candidate
    InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <attribute type = "view"/>
  <element type = "material"/>
</ElementType>

<ElementType name = "presentation" content = "eltOnly" order = "seq">
  <AttributeType name = "label" dt:type = "string"/>
  <attribute type = "label"/>
  <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
  <element type = "material" minOccurs = "0" maxOccurs = "*" />
  <group order = "seq" minOccurs = "1" maxOccurs = "*">
    <group order = "one">
      <element type = "response_lid"/>
      <element type = "response_xy"/>
      <element type = "response_str"/>
      <element type = "response_num"/>
      <element type = "response_grp"/>
      <element type = "response_extension"/>
    </group>
  </group>
  <element type = "material" minOccurs = "0" maxOccurs = "*" />
</group>
</ElementType>

<ElementType name = "response_lid" content = "eltOnly" order = "seq">
  <AttributeType name = "rcardinality" dt:type = "enumeration" dt:values =
    "Single Multiple Ordered" default = "Single"/>
  <AttributeType name = "rtiming" dt:type = "enumeration" dt:values = "Yes No"
    default = "No"/>
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <attribute type = "rcardinality"/>
  <attribute type = "rtiming"/>
  <attribute type = "ident"/>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one">
    <element type = "render_choice"/>
    <element type = "render_hotspot"/>
    <element type = "render_slider"/>
    <element type = "render_fib"/>
    <element type = "render_extension"/>
  </group>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "response_xy" content = "eltOnly" order = "seq">
  <AttributeType name = "rcardinality" dt:type = "enumeration" dt:values =
    "Single Multiple Ordered" default = "Single"/>
  <AttributeType name = "rtiming" dt:type = "enumeration" dt:values = "Yes No"

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        default = "No"/>
<AttributeType name = "ident" dt:type = "string" required = "yes"/>
<attribute type = "rcardinality"/>
<attribute type = "rtiming"/>
<attribute type = "ident"/>
<element type = "material" minOccurs = "0" maxOccurs = "1"/>
<group order = "one">
  <element type = "render_choice"/>
  <element type = "render_hotspot"/>
  <element type = "render_slider"/>
  <element type = "render_fib"/>
  <element type = "render_extension"/>
</group>
<element type = "material" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "response_str" content = "eltOnly" order = "seq">
  <AttributeType name = "rcardinality" dt:type = "enumeration" dt:values =
    "Single Multiple Ordered" default = "Single"/>
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "rtiming" dt:type = "enumeration" dt:values = "Yes No"
    default = "No"/>
  <attribute type = "rcardinality"/>
  <attribute type = "ident"/>
  <attribute type = "rtiming"/>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one">
    <element type = "render_choice"/>
    <element type = "render_hotspot"/>
    <element type = "render_slider"/>
    <element type = "render_fib"/>
    <element type = "render_extension"/>
  </group>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "response_num" content = "eltOnly" order = "seq">
  <AttributeType name = "numtype" dt:type = "enumeration" dt:values = "Integer
    Decimal Scientific" default = "Integer"/>
  <AttributeType name = "rcardinality" dt:type = "enumeration" dt:values =
    "Single Multiple Ordered" default = "Single"/>
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "rtiming" dt:type = "enumeration" dt:values = "Yes No"
    default = "No"/>
  <attribute type = "numtype"/>
  <attribute type = "rcardinality"/>
  <attribute type = "ident"/>
  <attribute type = "rtiming"/>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one">
    <element type = "render_choice"/>
    <element type = "render_hotspot"/>
    <element type = "render_slider"/>
    <element type = "render_fib"/>
    <element type = "render_extension"/>
  </group>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "response_grp" content = "eltOnly" order = "seq">
  <AttributeType name = "rcardinality" dt:type = "enumeration" dt:values =
    "Single Multiple Ordered" default = "Single"/>
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "rtiming" dt:type = "enumeration" dt:values = "Yes No"
    default = "No"/>
  <attribute type = "rcardinality"/>
  <attribute type = "ident"/>
  <attribute type = "rtiming"/>
  <element type = "material" minOccurs = "0" maxOccurs = "1"/>
  <group order = "one">
    <element type = "render_choice"/>

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        <element type = "render_hotspot"/>
        <element type = "render_slider"/>
        <element type = "render_fib"/>
        <element type = "render_extension"/>
    </group>
    <element type = "material" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "response_label" content = "mixed" order = "many">
    <AttributeType name = "rshuffle" dt:type = "enumeration" dt:values = "Yes No"
        default = "Yes"/>
    <AttributeType name = "rarea" dt:type = "enumeration" dt:values = "Ellipse
        Rectangle Bounded" default = "Ellipse"/>
    <AttributeType name = "rrange" dt:type = "enumeration" dt:values = "Exact
        Range" default = "Exact"/>
    <AttributeType name = "labelrefid" dt:type = "string"/>
    <AttributeType name = "ident" dt:type = "string" required = "yes"/>
    <attribute type = "rshuffle"/>
    <attribute type = "rarea"/>
    <attribute type = "rrange"/>
    <attribute type = "labelrefid"/>
    <attribute type = "ident"/>
    <element type = "qticomment"/>
    <element type = "material"/>
</ElementType>

<ElementType name = "response_na" content = "mixed" model = "open"/>
<ElementType name = "render_choice" content = "eltOnly" order = "seq">
    <AttributeType name = "shuffle" dt:type = "enumeration" dt:values = "Yes No"
        default = "No"/>
    <AttributeType name = "minnumber" dt:type = "string"/>
    <AttributeType name = "maxnumber" dt:type = "string"/>
    <attribute type = "shuffle"/>
    <attribute type = "minnumber"/>
    <attribute type = "maxnumber"/>
    <group order = "many">
        <element type = "material"/>
        <element type = "response_label"/>
    </group>
    <element type = "response_na" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "render_hotspot" content = "eltOnly" order = "seq">
    <AttributeType name = "maxnumber" dt:type = "string"/>
    <AttributeType name = "minnumber" dt:type = "string"/>
    <AttributeType name = "showdraw" dt:type = "enumeration" dt:values = "Yes No"
        default = "No"/>
    <attribute type = "maxnumber"/>
    <attribute type = "minnumber"/>
    <attribute type = "showdraw"/>
    <group order = "many">
        <element type = "material"/>
        <element type = "response_label"/>
    </group>
    <element type = "response_na" minOccurs = "0" maxOccurs = "1"/>
</ElementType>

<ElementType name = "render_slider" content = "eltOnly" order = "seq">
    <AttributeType name = "orientation" dt:type = "enumeration" dt:values =
        "Horizontal Vertical" default = "Horizontal"/>
    <AttributeType name = "lowerbound" dt:type = "string" required = "yes"/>
    <AttributeType name = "upperbound" dt:type = "string" required = "yes"/>
    <AttributeType name = "step" dt:type = "string"/>
    <AttributeType name = "startval" dt:type = "string"/>
    <AttributeType name = "steplabel" dt:type = "enumeration" dt:values = "Yes No"
        default = "No"/>
    <AttributeType name = "maxnumber" dt:type = "string"/>
    <AttributeType name = "minnumber" dt:type = "string"/>
    <attribute type = "orientation"/>
    <attribute type = "lowerbound"/>
    <attribute type = "upperbound"/>

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    <attribute type = "step"/>
    <attribute type = "startval"/>
    <attribute type = "steplabel"/>
    <attribute type = "maxnumber"/>
    <attribute type = "minnumber"/>
    <group order = "many">
      <element type = "material"/>
      <element type = "response_label"/>
    </group>
    <element type = "response_na" minOccurs = "0" maxOccurs = "1"/>
  </ElementType>

  <ElementType name = "render_fib" content = "eltOnly" order = "seq">
    <AttributeType name = "encoding" dt:type = "string" default = "UTF_8"/>
    <AttributeType name = "fibtype" dt:type = "enumeration" dt:values = "String
      Integer Decimal Scientific" default = "String"/>
    <AttributeType name = "rows" dt:type = "int"/>
    <AttributeType name = "maxchars" dt:type = "int"/>
    <AttributeType name = "prompt" dt:type = "enumeration" dt:values = "Box
      Dashline Asterisk Underline"/>
    <AttributeType name = "columns" dt:type = "int"/>
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    <AttributeType name = "maxnumber" dt:type = "string"/>
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      <element type = "response_label"/>
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  </ElementType>

  <ElementType name = "resprocessing" content = "eltOnly" order = "seq">
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    <attribute type = "scoremodel"/>
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
    <element type = "outcomes"/>
    <group order = "one" minOccurs = "1" maxOccurs = "*">
      <element type = "rescondition"/>
      <element type = "itemproc_extension"/>
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  </ElementType>

  <ElementType name = "outcomes" content = "eltOnly" order = "seq">
    <element type = "qticomment" minOccurs = "0" maxOccurs = "1"/>
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      <element type = "decvar"/>
      <element type = "interpretvar"/>
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  </ElementType>

  <ElementType name = "rescondition" content = "eltOnly" order = "seq">
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      default = "No"/>
    <AttributeType name = "title" dt:type = "string"/>
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    <attribute type = "title"/>
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    <element type = "displayfeedback" minOccurs = "0" maxOccurs = "*" />
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  </ElementType>

```

```
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    Administrator AdminAuthority Assessor Author Candidate
    InvigilatorProctor Psychometrician Scorer Tutor" default = "All"/>
  <AttributeType name = "ident" dt:type = "string" required = "yes"/>
  <AttributeType name = "title" dt:type = "string"/>
  <attribute type = "view"/>
  <attribute type = "ident"/>
  <attribute type = "title"/>
  <element type = "material"/>
  <element type = "solution" minOccurs = "1" maxOccurs = "*" />
  <element type = "hint" minOccurs = "1" maxOccurs = "*" />
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  <AttributeType name = "feedbackstyle" dt:type = "enumeration" dt:values =
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  <attribute type = "feedbackstyle"/>
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  <element type = "solutionmaterial" minOccurs = "1" maxOccurs = "*" />
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  <element type = "material"/>
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