ANSI /MEDBIQ ME.10.1-2009
Medical Education Metrics
Specifications and Description Document

Version: 1.0
Date: 26 August 2009
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Version History

Version No.	Date	Changed By	Changes Made
1.0	26 August 2009		

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Acknowledgements

MedBiquitous wishes to acknowledge the help of the MedBiquitous Metrics Working Group members, invited experts, and other individuals that contributed to the creation of this document, including:

- Linda Casebeer, Ph.D., Outcomes, Inc. **Co-Chair**
- Francis Kwakwa, Radiological Society of North America, **Co-Chair**

- Craig Bowen, Ph.D., Johns Hopkins University
- Jennifer Comerford, Radiological Society of North America
- David Cook, M.D., Mayo Clinic
- Nancy Davis, Ph.D., Chair, American Academy of Family Physicians
- Bill Deluise, John Wiley and Sons
- Ray Everngam, CTSNet
- Michael Fordis, MD, Baylor College of Medicine
- Nancy Gathany, Centers for Disease Control and Prevention
- Peter Greene, M.D., MedBiquitous
- Cyndi Grimes, Medscape
- Stuart Gilman, M.D., Department of Veterans Affairs
- Monica Hanks, American Association of Critical-Care Nurses
- Sean Hayes, AXDEV
- Edward Kennedy, Accreditation Council of Continuing Medical Education
- Jack Kues, PhD, University of Cinicnnati
- Tao Le, M.D., Johns Hopkins University
- Jim Leist, Alliance for Continuing Medical Education
- Rachel Makleff, American Thoracic Society
- Ross Martin, MD, Bearing Point
- Tarun Mathur, Medsn
- Jackie Mayhew, Pfizer
- Suzanne Murray, Ph.D., AXDEV
- Kevin O'Hara, Healthstream
- Veronica O'Quinn, METI
- Mellie Pouwels, Radiological Society of North America
- Andrew Rabin, CECity
- Mike Saxton, Pfizer
- Hilary Schmidt, Sanofi Aventis
- Donna Schoonover, Department of Veterans Affairs
- Valerie Smothers, MedBiquitous
- Jing Tian, M.D., Ph,D, University of Maryland
- Scott Weber, Med-IQ
- Tim Willett, M.D., CRI Critical Care Education Network
- Andrea Young, Centers for Disease Control and Prevention

Specification authors also received technical guidance from members of the MedBiquitous Technical Steering Committee.

- Joel Farrell, IBM, Technical Steering Committee Chair
- Scott Hinkelman, IBM
- Dan Rehak
- Darin McBeath, Elsevier Science

Introduction

This document describes MedBiquitous Medical Education Metrics specification, or MEMS, in detail. It is intended for use by anyone who wants to develop tools or implement electronic systems for measuring the quality of educational activities for health professionals or for aggregating such data. The status of the document is indicated at the bottom of the page; draft documents are subject to review and approval through the MedBiquitous and ANSI standards development processes (see http://www.medbiq.org/working_groups/consortium_process/MedBiquitousANSIProcess.pdf).

The objective of MEMS is to provide a consistent format and data structure for representing metrics for health professions education, particularly continuing education activities. This structure then enables the exchange of education metrics between disparate systems and organizations over the Web.

As the Institute of Medicine and others call for reforms to Continuing Medical Education and other types of Continuing Education (CE) for the health professions, there has been an increasing focus on measuring the quality of CE activities. Educators may use aggregate data on the reach and efficacy of CE activities to evaluate the effectiveness of their educational activities or of their overall educational program. Educators, accrediting bodies, CE supporters, and government agencies often collect educational outcomes data in order to gauge improvement and identify strong or weak activities. Certifiers, accrediting bodies, and supporters may use this data to monitor the success of multiple educational activities and programs as a whole. Industry groups may compile data to facilitate research and advancement across the industry.

Currently, the data collected comes in different formats and often measures different things, making it difficult to compare metrics within or across organizations. Promoting consistent evaluation measurements will enable many educators to look at measurements across activities within their own organization or across the industry. This in turn could help educators identify ways to improve their activities and programs.

The standard allows extensions so that evaluation data beyond the core set identified in this document may be communicated to other organizations. This specification is not intended to encapsulate all metrics data that will be maintained in an organization's internal systems; rather, it is intended to encapsulate the key quality metrics that may be compiled within the organization or transmitted to an outside organization interested in collecting data on the quality of educational activities.

Documentation Conventions

This document uses the following conventions.

Documentation Conventions

Convention	Description
`monospaced type`	Sample XML tags, code, schema, or portion thereof
BoldText	When used with an XML tag name, indicates that the element contains sub-elements
Italicized Text	When used in an XML tag description, an attribute of the XML tag.
Tag description	Shading indicated that the tag is further described in a later part of the document

The following graphical standards are used for the XML diagrams in this document.
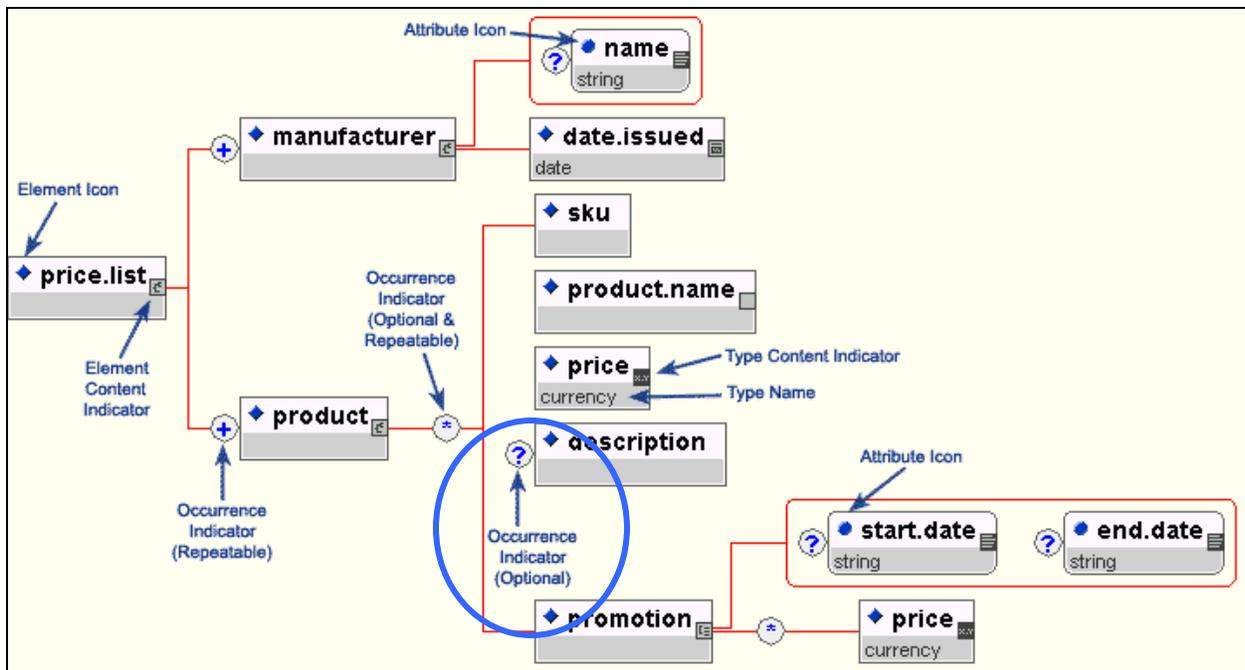
Graphical Standards from TIBCO's Turbo XML, Copyright TIBCO Software Inc.

Data Elements

The MEMS schema, medicaleducationmetrics.xsd, includes the following data elements. In most cases, these elements contain subelements.

1. MedicalEducationMetrics
2. ReportDescription
3. ActivityDescription
4. ParticipantActivityEvaluation
5. KnowledgeAssessment
6. ParticipationMetrics
7. XtensibleInfo

The root element is MedicalEducationMetrics.

Other Schema Referenced

The MEMS schema imports and refers to the Healthcare Learning Object Metadata schema, healthcarelom.xsd, and the Activity Report schema, activityreport.xsd. These schema and accompanying specification are available from the MedBiquitous XML Repository at http://www.medbiq.org/repository.

Healthcare Learning Object Metadata Schemas and Specifications are also available online at: http://ns.medbiq.org/lom/extend/v1/healthcarelom.zip

Activity Report Schema and Specification are available online at: http://ns.medbiq.org/activityreport/v1/

MEMS Schema Grammar

The following sections explain the MEMS schema grammar. Values in **bold** under XML Tags column indicate that the element has sub-elements.

All the elements having sub-elements will be defined in separate sections. All elements without sub-elements will be defined within the appropriate element sections that use them.

1   *MedicalEducationMetrics*

MedicalEducationMetrics is the root element. It contains evaluation data for one educational activity. MedicalEducationMetrics is required and must occur once within a MEMS document.

MedicalEducationMetrics has a series of subelements that are defined in this document.
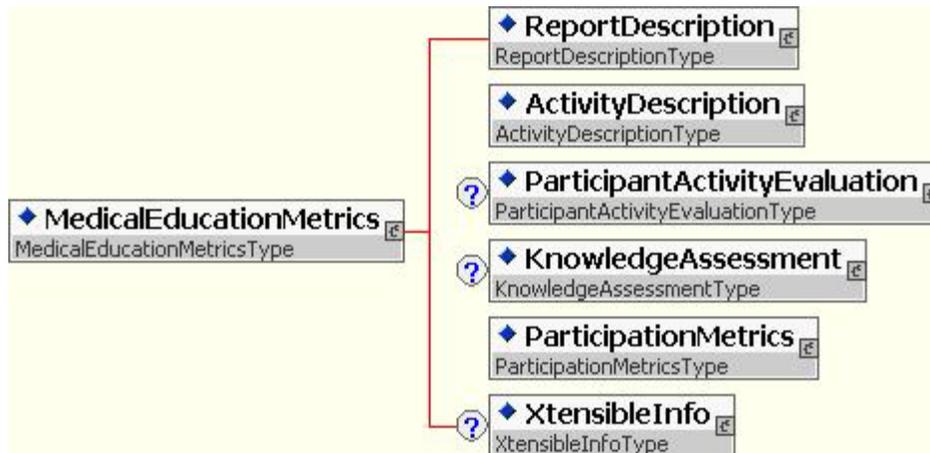
MedicalEducationMetrics Information

Element	Description	Required	Multiplicity	Datatype
MedicalEducationMetrics	MedicalEducationMetrics is the root element. It contains sub-elements that define evaluation data for a health professions educational activity.	Required	1	Container
ReportDescription	ReportDescription is the sub-element of MedicalEducationMetrics. It contains subelements that provide details about the scope of the report. See section ReportDescription for more information.	Required	1	Container

Element	Description	Required	Multiplicity	Datatype
ActivityDescription	ActivityDescription is the sub-element of MedicalEducationMetrics. It contains elements that describe and identify the educational activity that is being evaluated. See section ActivityDescription for more information.	Required	1	Container
ParticipantActivityEvaluation	ParticipantActivityEvaluation is the sub-element of MedicalEducationMetrics. It contains elements that define a how participants evaluated the educational activity in detail. See section ParticipantActivityEvaluation for more information.	Optional	0 or 1	Container
KnowledgeAssessment	KnowledgeAssessment is the sub-element of MedicalEducationMetrics. It contains elements that define how participants responded to a set of multiple choice assessment items. See section Knowledge Assessment for more information.	Optional	0 or 1	Container
ParticipationMetrics	ParticipationMetrics is the sub-element of MedicalEducationMetrics. It contains elements that define data on the number of learners participating in the activity and the extent of their participation. See section ParticipationMetrics for more information.	Required	1	Container
XtensibleInfo	XtensibleInfo contains sub-elements defined by the organization implementing the schema. See section XtensibleInfo for more information.	Optional	0 or 1	Container

Example:

```
<MedicalEducationMetrics>
   <ReportDescription>
    ...
   </ReportDescription>
```

```
   <ActivityDescription>
    ...
   </ActivityDescription>
   <ParticipantActivityEvaluation>
    ...
   </ParticipantActivityEvaluation>
   <KnowledgeAssessment>
    ...
   </KnowledgeAssessment>
   <ParticipationMetrics>
    ...
   </ParticipationMetrics>
</MedicalEducationMetrics>
```

2   ReportDescription

ReportDesciption contains subelements that provide details about the scope of the report data.

ReportDescription Information

Element	Description	Required	Multiplicity	Datatype
ReportDescription	ReportDescription is the sub-element of MedicalEducationMetrics. It contains subelements that provide details about the scope of the report.	Required	1	Container
RespondentCategory	RespondentCategory is the sub-element of ReportDescription. It identifies a respondent category for the metrics information contained in this dataset. This is useful when reporting evaluation data by profession or other category. RespondentCategory has the following attributes: *source* Indicates a source vocabulary for the	Optional	0 or 1	NonNullString

Element	Description	Required	Multiplicity	Datatype
	respondent category. *id* Indicates the term identifier in the source vocabulary referenced.			
ReportingStartDate	ReportingStartDate is the sub-element of ReportDescription. It defines the first day of the reporting period for the metrics described for this educational activity.	Required	1	Date
ReportingEndDate	ReportingEndDate is the sub-element of ReportDescription. It defines the last day of the reporting period for the metrics described for this educational activity.	Required	1	Date

Example:

```
<ReportDescription>
   <RespondentCategory>practicing physicians</RespondentCategory>
   <ReportingStartDate>2008-01-01</ReportingStartDate>
   <ReportingEndDate>2008-03-31</ReportingEndDate>
</ReportDescription>
```

3 *ActivityDescription*

ActivityDescription defines the educational activity that was evaluated. ActivityDescription uses the MedBiquitous standard for Healthcare Learning Object Metadata (Healthcare LOM) along with other data elements. Healthcare LOM allows providers to describe the title, format, unique identifier, credits, commercial support, intent, and other important information about an educational activity.

ActivityDescription Information

Element	Description	Required	Multiplicity	Datatype
ActivityDescription	ActivityDescription is the sub-element of MedicalEducationMetrics. It contains elements that identify and describe the educational activity evaluated in detail.	Required	1	Container
lom	lom is the sub-element of ActivityDescription. It contains sub-elements that describe the title, number and type of credits, subject, and other aspects of an educational experience in detail. The lom element is defined in the Healthcare Learning Object Metadata standard defined by MedBiquitous. Please see the Healthcare Learning Object Metadata Specifications and Description document for more information on the sub-elements of lom.	Required	1	Container See Healthcare Learning Object Metadata specification and healthcarelom.xsd for more information.
CommercialSupportAmount	CommercialSupportAmount is the subelement of ActivityDescription that indicates the amount of commercial support received from a single source. CommercialSupportAmount has the following attributes: *currency* The currency of the amount indicated. Recommended values are ISO 4217 3-letter alphabetic codes. For example, USD for US dollar, CAD for the Canadian dollar, and EUR for the Euro. Valid values are limited to 3-character strings. *supportsource* The organization that is the source of the commercial support.	Optional	0 or more	Integer

Element	Description	Required	Multiplicity	Datatype
AdvertisingAndExhibitIncome	AdvertisingAndExhibitIncome is the subelement of ActivityDescription that indicates the amount of advertising and exhibit income received for this activity. AdvertisingAndExhibitIncome has the following attribute: *currency* The currency of the amount indicated. Recommended values are ISO 4217 3-letter alphabetic codes. For example, USD for US dollar, CAD for the Canadian dollar, and EUR for the Euro. Valid values are limited to 3-character strings.	Optional	0 or 1	Integer
OtherIncome	OtherIncome is the subelement of ActivityDescription that indicates the amount of income from sources other than commercial support, advertising, and exhibits. OtherIncome has the following attribute: *currency* The currency of the amount indicated. Recommended values are ISO 4217 3-letter alphabetic codes. For example, USD for US dollar, CAD for the Canadian dollar, and EUR for the Euro. Valid values are limited to 3-character strings.	Optional	0 or 1	Integer

Element	Description	Required	Multiplicity	Datatype
Expenses	Expenses is the sub-element of ActivityDesciption that indicates the total expenses of the activity. Expenses has the following attribute: *currency* The currency of the amount indicated. Recommended values are ISO 4217 3-letter alphabetic codes. For example, USD for US dollar, CAD for the Canadian dollar, and EUR for the Euro. Valid values are limited to 3-character strings.	Optional	0 or 1	Integer
DesignedToChangeCompetence	DesignedToChangeCompetence is the sub-element of ActivityDesciption that indicates if the activity is designed to change competence. Valid Values are true and false.	Optional	0 or 1	Boolean
DesignedToChangePerformance	DesignedToChangePerformance is the sub-element of ActivityDesciption that indicates if the activity is designed to change performance. Valid Values are true and false.	Optional	0 or 1	Boolean
DesignedToChangePatientOutcomes	DesignedToChangePatientOutcomes is the sub-element of ActivityDesciption that indicates if the activity is designed to change patient outcomes. Valid Values are true and false.	Optional	0 or 1	Boolean
ChangesInCompetenceMeasured	ChangesInCompetenceMeasured is the sub-element of ActivityDescription that indicates if changes in competence were measured as part of activity evaluation.	Optional	0 or 1	Boolean
ChangesInPerformanceMeasured	ChangesInPerformanceMeasured is the sub-element of ActivityDescription that indicates if changes in performance were measured as part of activity evaluation.	Optional	0 or 1	Boolean

Element	Description	Required	Multiplicity	Datatype
ChangesInPatientOutcomesMeasured	ChangesInPatientOutcomesMeasured is the sub-element of ActivityDescription that indicates if changes in patient outcomes were measured as part of activity evaluation.	Optional	0 or 1	Boolean

Usage Note	To uniquely identify an educational activity, use the identifier entry element within Healthcare LOM. URLs are one type of identifier that may be used.
	For example:
	http://www.medbiq.org/course16355
	Please note that the URL in this context is used to uniquely identify the educational activity and does not need to map to the course web page or other course information.

Example:

```
<ActivityDescription>
   <lom:lom>
      <lom:general>
         <lom:identifier>
            <lom:catalog>URI</lom:catalog>
            <lom:entry> https://www2.mysite.org/TNT_products.cfm?prod=COD77
            </lom:entry>
         </lom:identifier>
         <lom:title>
            <lom:string>Case of the Day, May 2007</lom:string>
         </lom:title>
         <lom:language>en</lom:language>
         <lom:description>
            <lom:string>An introduction to breast imaging. Learning Objectives: 1) Identify,
characterize, and analyze abnormal findings on multimodality breast imaging studies. </lom:string>
         </lom:description>
         <lom:keyword id="D001940" source="MeSH">
```

```xml
            <lom:string>breast</lom:string>
        </lom:keyword>
        <lom:keyword id="D003952" source="MeSH" >
            <lom:string>diagnostic imaging</lom:string>
        </lom:keyword>
    </lom:general>
    <hx:healthcareMetadata>
        <hx:healthcareEducation>
            <hx:expirationDate>2010-07-19</hx:expirationDate>
            <hx:creditsAvailable>yes</hx:creditsAvailable>
            <hx:credits>
                <hx:accreditingBody>ACCME</hx:accreditingBody>
                <hx:activityCertification>
                  AMA PRA category 1
                </hx:activityCertification>
                <hx:creditType>CME</hx:creditType>
                <hx:creditUnit>Credit</hx:creditUnit>
                <hx:numberOfCredits>1</hx:numberOfCredits>
            </hx:credits>
            <hx:participationModality>technology based</hx:participationModality>
        </hx:healthcareEducation>
    </hx:healthcareMetadata>
</lom:lom>
<CommercialSupportAmount currency="USD" supportSource="SeeRite Imaging
Company">5000</CommercialSupportAmount>
<AdvertisingAndExhibitIncome>0</AdvertisingAndExhibitIncome>
<OtherIncome currency="USD">5400</OtherIncome>
<Expenses currency="USD">9550</Expenses>
<DesignedToChangeCompetence>true</DesignedToChangeCompetence>
<DesignedToChangePerformance>false</DesignedToChangePerformance>
<DesignedToChangePatientOutcomes>false</DesignedToChangePatientOutcomes>
<ChangesInCompetenceMeasured>true</ChangesInCompetenceMeasured>
<ChangesInPerformanceMeasured>false</ChangesInPerformanceMeasured>
<ChangesInPatientOutcomesMeasured>false</ChangesInPatientOutcomesMeasured>
</ActivityDescription>
```
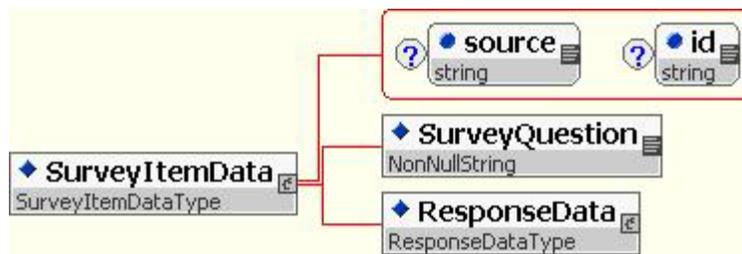
4 *ParticipantActivityEvaluation*

ParticipantActivityEvaluation defines how participants evaluated the educational activity.
ParticipantActivityEvaluation is a sub-element of MedicalEducationMetrics.

ParticipantActivityEvaluation Information

Element	Description	Required	Multiplicity	Datatype
ParticipantActivityEvaluation	ParticipantActivityDescription is the sub-element of MedicalEducationMetrics. It contains elements that identify and describe the educational activity evaluated in detail.	Optional	0 or 1	Container
SurveyItemDataData	SurveyItemDataData is the sub-element of ParticipantActivityEvaluation. It contains subelements that define a survey question and learner responses to that question. See section SurveyItemDataData for more information.	Optional	0 or more	Container
ComparisonData	ComparisonData is the subelement of ParticipantActivityEvaluation. It contains subelements that define a set of related survey questions and learner responses. See section ComparisonData for more information.	Optional	0 or more	Container

Example:

```
<ParticipantActivityEvaluation>
   <SurveyItemData>
      ...
   </SurveyItemData>
   <SurveyItemData>
      ...
   </SurveyItemData>
   <SurveyItemData>
```

```
    ...
  </SurveyItemData>
  <ComparisonData>
    ...
  </ComparisonData>
  <ComparisonData>
    ...
  </ComparisonData>
</ParticipantActivityEvaluation>
```

4.1 SurveyItemData

SurveyItemData contains subelements that define a survey question and learner responses to that question. SurveyItemData may reference a question from a standardized question set.

SurveyItemData Information

Element	Description	Required	Multiplicity	Datatype
SurveyItemData	SurveyItemData is the sub-element of ParticipantActivityEvaluation. It contains subelements that define a survey question and learner responses to that question. SurveyItemData has the following attributes: *source* Indicates a source vocabulary for the survey item. *id* Indicates the item identifier in the source vocabulary referenced.	Required	0 or more	Container
SurveyQuestion	SurveyQuestion is the sub-element of SurveyItemData that indicates the text of the survey question.	Required	1	NonNullString

Element	Description	Required	Multiplicity	Datatype
ResponseData	ResponseData is the sub-element of SurveyItemData. It contains subelements that show the response data for this question. For more information, see section ResponseData.	Required	1	Container

Example:

```
<SurveyItemData source="CMEQual Survey" id="123">
   <SurveyQuestion>
    ...
   </SurveyQuestion>
   <ResponseData>
    ...
   </ResponseData>
</SurveyItemData>
```
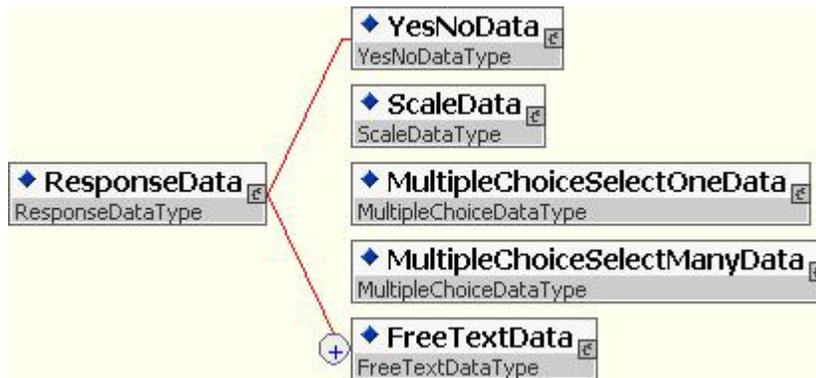
4.2 ResponseData

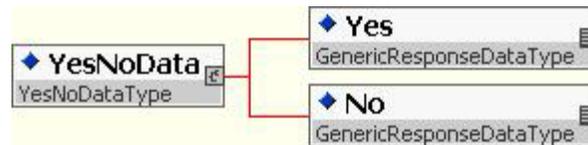ResponseData shows the response data for a specific survey question.

ResponseData Information

Element	Description	Required	Multiplicity	Datatype
ResponseData	Response is the sub-element of SurveyItemData or SurveyItemDataForComparison. It contains subelements that show the response data for this question.	Required	1	Container
YesNoDataData	YesNoData is the sub-element of ResponseData. It contains response data for yes/no questions. See section YesNoData for more information.	YesNoData or another subelement of ResponseData is required	0 or 1	Container
ScaleData	ScaleData is the sub-element of ResponseData. It contains response data for scale questions, including Likert scale questions. See section ScaleData for more information.	ScaleData or another subelement of ResponseData is required	0 or 1	Container
MultipleChoiceSelectOneData	MultipleChoiceSelectOneData is the sub-element of ResponseData. It contains response data for a multiple choice question in which the learner may select only one answer. See section MultipleChoiceSelectOneData for more information.	MultipleChoice SelectOneData or another subelement of ResponseData is required	0 or 1	Container
MultipleChoiceSelectManyData	MultipleChoiceSelectManyData is the sub-element of ResponseData. It contains response data for a multiple choice question in which the learner may select multiple answers. See section MultipleChoiceSelectManyData for more information.	MultipleChoice SelectManyData or another subelement of ResponseData is required	0 or 1	Container
FreeTextData	FreeTextData is the sub-element of ResponseData and contains response data for free text questions. See section FreeTextData for more information.	FreeTextData or another subelement of ResponseData is required	0 or more	Container

Example:

```
<ResponseData>
    <ScaleData type="likert" points="5">
        <One label="Strongly Agree">100</One>
        <Two>40</Two>
        <Three>10</Three>
        <Four>0</Four>
        <Five label="Strongly Disagree">0</Five>
    </ScaleData>
</ResponseData>
```

4.3 YesNoData

The YesNoData defines how many participants answered yes and no to a given question. Each response may be tied to a standardized instrument with unique identifiers for each response. Such identifiers facilitate data compilation across disparate data sets.

YesNoDataType Information

Element	Description	Required	Multiplicity	Datatype
YesNoData	YesNoData contains response data for yes/no questions.	YesNoData or another subelement of ResponseData is required	0 or 1	Container
Yes	Yes defines how many participants answered Yes to the question. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Required	1	Integer

Element	Description	Required	Multiplicity	Datatype
No	No defines how many participants answered No to the question.	Required	1	Integer
	source Indicates a source vocabulary or instrument for the item response.			
	id Indicates the unique response identifier in the source referenced.			

Example:

```
<YesNoData>
   <Yes>140</Yes>
   <No>10</No>
</YesNoData>
```

4.4 ScaleData

ScaleData contains response data for scale questions, including Likert scale questions. Each response may be tied to a standardized instrument with unique identifiers for each response. Such identifiers facilitate data compilation across disparate data sets.
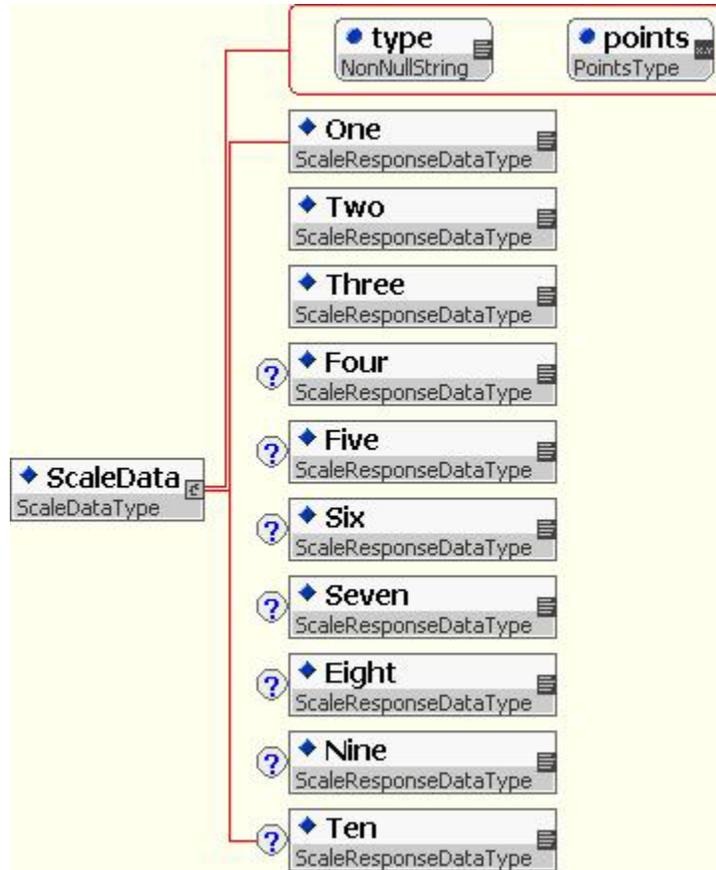
Scales are intended to measure an individual's opinion or perception using a numeric or graduated scale. The following are examples of scales.

Strongly agree   1   2   3   4   5   6   7   Strongly disagree

Strongly agree   Agree   Neither agree nor disagree   Disagree   Strongly Disagree

Unsafe   1   2   3   4   5   Safe

Scales should only use subelements corresponding to the number of points in the scale. For example, a five point scale would use subelements one through five but not subelements six through ten.

ScaleData Information

Element	Description	Required	Multiplicity	Datatype
ScaleData	ScaleData contains response data for scale questions, including Likert scale questions. ScaleData has the following attributes: *type* Indicates the type of scale. For example, likert, unsafe/safe, ineffective/effective. *points* Indicates the number of points in the scale. The value must be an integer that is equal to or higher than 3 and no higher than 10.	ScaleData or another subelement of Response Data is required	0 or 1	Container
One	One is a sub-element of ScaleData and indicates the number of individuals indicating one as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Required	1	Integer
Two	Two is a sub-element of ScaleData and indicates the number of individuals indicating two as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Required	1	Integer

Element	Description	Required	Multiplicity	Datatype
Three	Three is a sub-element of ScaleData and indicates the number of individuals indicating three as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Required	1	Integer
Four	Four is a sub-element of ScaleData and indicates the number of individuals indicating four as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 to 1	Integer
Five	Five is a sub-element of ScaleData and indicates the number of individuals indicating five as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 to 1	Integer

Element	Description	Required	Multiplicity	Datatype
Six	Six is a sub-element of ScaleData and indicates the number of individuals indicating six as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 to 1	Integer
Seven	Seven is a sub-element of ScaleData and indicates the number of individuals indicating seven as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 to 1	Integer
Eight	Eight is a sub-element of ScaleData and indicates the number of individuals indicating eight as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 to 1	Integer

Element	Description	Required	Multiplicity	Datatype
Nine	Nine is a sub-element of ScaleData and indicates the number of individuals indicating nine as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 or 1	Integer
Ten	Ten is a sub-element of ScaleData and indicates the number of individuals indicating ten as their response on a scale question. *label* Indicates a label for this point on the scale. For example, Strongly Agree. Labels should be used for the first and last point on a scale at a minimum. *source* Indicates a source vocabulary or instrument for the item response. *id* Indicates the unique response identifier in the source referenced.	Optional	0 or 1	Integer

Example:

```xml
<ScaleData type="likert" points="5">
    <One label="Strongly Agree">100</One>
    <Two>40</Two>
    <Three>10</Three>
    <Four>0</Four>
    <Five label="Strongly Disagree">0</Five>
</ScaleData>
```

4.5 MultipleChoiceSelectOneData

MultipleChoiceSelectOneData contains response data for a multiple choice question in which the learner may select only one answer.

MultipleChoiceSelectOneData Information

Element	Description	Required	Multiplicity	Datatype
MultipleChoiceSelectOneData	MultipleChoiceSelectOneData contains response data for a multiple choice question in which the learner may select only one answer.	MultipleChoice SelectOne or another subelement of ResponseData is required.	1	Container
ResponseItemData	ResponseItemData is a sub-element of MultipleChoiceSelectOneData that describes the response options to a multiple choice question and the number of respondents that selected each response. See section ResponseItemData for more information.	Required	1 or more	Container

Example:

```
<SurveyQuestion>How many years have you been in practice?</SurveyQuestion>
<ResponseData>
   <MultipleChoiceSelectOneData>
      <ResponseItemData>
         <ResponseText>less than 5 years</ResponseText>
         <TotalRespondents>20</TotalRespondents>
      </ResponseItemData>
```

```xml
<ResponseItemData>
    <ResponseText>5-10 years</ResponseText>
    <TotalRespondents>50</TotalRespondents>
</ResponseItemData>
<ResponseItemData>
    <ResponseText>10-20 years</ResponseText>
    <TotalRespondents>70</TotalRespondents>
</ResponseItemData>
<ResponseItemData>
    <ResponseText>more than 20 years</ResponseText>
    <TotalRespondents>20</TotalRespondents>
</ResponseItemData>
</MultipleChoiceSelectOneData>
</ResponseData>
```
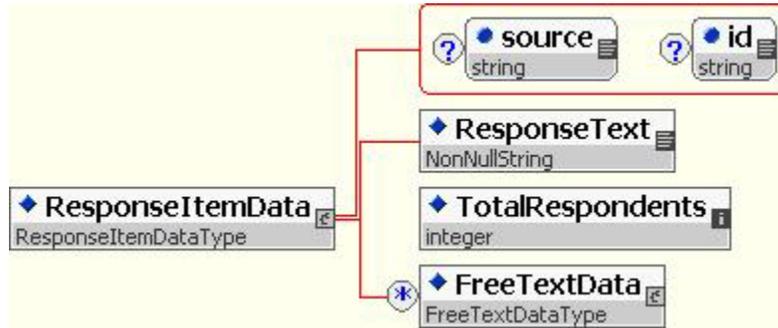
4.6 ResponseItemData

ResponseItemData describes the response options to a multiple choice question and the number of respondents that selected each response. Responses may be tied to a standardized instrument with unique identifiers for each response item. Such identifiers facilitate data compilation across disparate data sets.

ResponseItemData Information

Element	Description	Required	Multiplicity	Datatype
ResponseItemData	ResponseItemData describes the response options to a multiple choice question and the number of respondents that selected each response.	Required	1 or more	Container
	source Indicates a source vocabulary for the response item.			
	id Indicates the item identifier in the source vocabulary referenced.			
ResponseText	ResponseText is a sub-element of ResponseItemData. ResponseText defines the text of the response option.	Required	1	NonNullString
TotalRespondents	TotalRespondents is a sub-element of ResponseItemData that indicates the number of respondents that selected this response item.	Required	1	Integer

Element	Description	Required	Multiplicity	Datatype
FreeTextData	FreeTextData is a sub-element of ResponseItemData. FreeTextData is used when a multiple choice question gives respondents the option to enter their own response. See section FreeTextData for more information.	Optional	0 or more	Container

Example:

```
<ResponseItemData>
    <ResponseText>less than 5 years</ResponseText>
    <TotalRespondents>20</TotalRespondents>
</ResponseItemData>
```

4.7 MultipleChoiceSelectManyData

MultipleChoiceSelectManyData contains response data for a multiple choice question in which the learner may select multiple answers.

MultipleChoiceSelectManyData Information

Element	Description	Required	Multiplicity	Datatype
MultipleChoiceSelectManyData	MultipleChoiceSelectManyData contains response data for a multiple choice question in which the learner may select multiple answers.	MultipleChoice SelectManyData or another subelement of ResponseData is required.	1	Container
ResponseItemData	ResponseItemData is a sub-element of MultipleChoiceSelectManyData that describes the response options to a multiple choice question and the number of respondents that selected each response. See section ResponseItemData for more information.	Required	1 or more	Container

Example:

```
<SurveyQuestion>What factors influenced you to attend this program?</SurveyQuestion>
<ResponseData>
   <MultipleChoiceSelectManyData>
      <ResponseItemData>
         <ResponseText>Course description</ResponseText>
         <TotalRespondents>95</TotalRespondents>
      </ResponseItemData>
      <ResponseItemData>
         <ResponseText>List of faculty</ResponseText>
         <TotalRespondents>100</TotalRespondents>
```
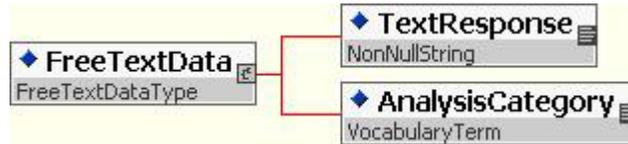
```
            </ResponseItemData>
            <ResponseItemData>
                <ResponseText>Host city</ResponseText>
                <TotalRespondents>40</TotalRespondents>
            </ResponseItemData>
        </MultipleChoiceSelectManyData>
    </ResponseData>
```

4.8 FreeTextData

In some cases respondents will be asked to write in the response to a question using their own words. The FreeTextData element provides a way to send these responses along with any descriptive categories assigned to them as a result of content analysis.

FreeTextData Information

Element	Description	Required	Multiplicity	Datatype
FreeTextData	FreeTextData contains response data for free text questions.	Optional	0 or more	Container
TextResponse	TextResponse is a subelement of FreeTextData that contains the text of the individual's response.	Required	1	NonNullString
AnalysisCategory	AnalysisCategory is a subelement of FreeTextData that indicates a category assigned to the free text response as a result of content analysis. AnalysisCategory has the following attributes: *source* Indicates a source vocabulary for the category. *id* Indicates the term identifier in the source vocabulary referenced.	Required	1	NonNullString

Example:

```
   <SurveyQuestion>If there were one thing you would change about the
program, what would it be?</SurveyQuestion>
   <ResponseData>
     <FreeTextData>
        <TextResponse>Great conference - wouldn't change a
thing.</TextResponse>
        <AnalysisCategory>Positive comment</AnalysisCategory>
     </FreeTextData>
```

```
    <FreeTextData>
        <TextResponse>Longer lunch for networking.</TextResponse>
        <AnalysisCategory>Logistics</AnalysisCategory>
    </FreeTextData>
    <FreeTextData>
        <TextResponse>Different faculty - we see the same faces every
year.</TextResponse>
        <AnalysisCategory>Faculty</AnalysisCategory>
    </FreeTextData>
    <FreeTextData>
        <TextResponse>Can we start later in the day?</TextResponse>
        <AnalysisCategory>Logistics</AnalysisCategory>
    </FreeTextData>
  </ResponseData>
```

4.9 ComparisonData

ComparisonData contains response data for two or more complementary or related survey questions and learner responses. Often the questions are asked at different points in time. For example, the questions may compare a learner's expectations before an activity with their perceptions following an activity or after a specified time period.

ComparisonData Information

Element	Description	Required	Multiplicity	Datatype
ComparisonData	ComparisonData is the subelement of ParticipantActivityEvaluation that defines a set of related survey questions and learner responses.	Optional	0 or more	Container
SurveyItemDataForComparison	SurveyItemDataForComparison is the subelement of ComparisonData that defines a single survey item and corresponding learner responses in a set of related survey items grouped for comparison. See section SurveyItemDataForComparison for more information.	Required	1 or more	Container

Example:

```
    <ComparisonData>
      <SurveyItemDataForComparison>
      . . .
```

```
        </SurveyItemDataForComparison>
        <SurveyItemDataForComparison>
        . . .
        </SurveyItemDataForComparison>
    </ComparisonData>
```
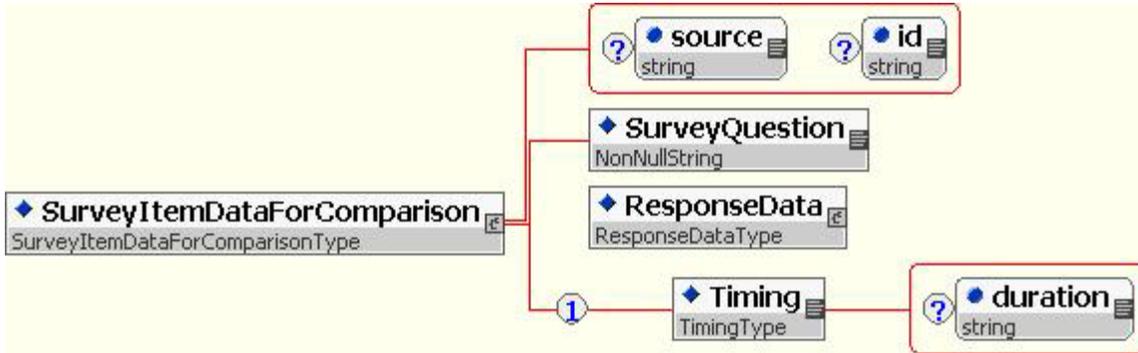
4.10 SurveyItemDataForComparison

SurveyItemDataForComparison defines a single survey item and corresponding learner responses in a set of related survey items grouped for comparison.

SurveyItemDataForComparison Information

Element	Description	Required	Multiplicity	Datatype
SurveyItemDataForComparison	SurveyItemDataForComparison is the subelement of ComparisonData that defines a single survey item and corresponding learner responses in a set of related survey items grouped for comparison. It has the following attributes: *source* Indicates a source vocabulary for the survey item. *id* Indicates the item identifier in the source vocabulary referenced.	Required	1 or more	Container
SurveyQuestion	SurveyQuestion is the sub-element of SurveyItemDataForComparison that indicates the text of the survey question.	Required	1	NonNullString
ResponseData	ResponseData is the sub-element of SurveyItemDataForComparison. It contains subelements that show the response data for this question. For more information, see section ResponseData.	Required	1	Container
Timing	Timing is the subelement of SurveyItemDataForComparison that indicates at what time in relation to the learning event this survey item was presented to the learner. Valid values are: Before, During, After. Timing has the following attribute. *duration* Indicates the amount of time before or after the learning activity the survey item was presented to the learner. For example, P1D would indicate one day before or after the activity.	Required	1	Restricted

Example:

```
<ComparisonData>
   <SurveyItemDataForComparison>
      <SurveyQuestion>Thinking about my expectations for this CME
activity, it is important  that it address my most pressing questions.
</SurveyQuestion>
      <ResponseData>
         <ScaleData type="low/high" points="5">
            <One label="Low">5</One>
            <Two>15</Two>
            <Three>35</Three>
            <Four>70</Four>
            <Five label="High">25</Five>
         </ScaleData>
      </ResponseData>
      <Timing duration="P1D">Before</Timing>
   </SurveyItemDataForComparison>
   <SurveyItemDataForComparison>
      <SurveyQuestion>Thinking about  my participation in this CME
activity, I thought it was able to address my most pressing questions.
</SurveyQuestion>
      <ResponseData>
         <ScaleData type="minimally/completely" points="5">
            <One label="Minimally">5</One>
            <Two>10</Two>
            <Three>30</Three>
            <Four>75</Four>
            <Five label="Completely">30</Five>
         </ScaleData>
      </ResponseData>
      <Timing duration="P1D">After</Timing>
   </SurveyItemDataForComparison>
</ComparisonData>
```
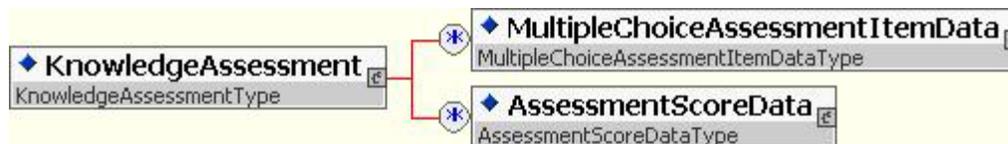
5 KnowledgeAssessment

KnowledgeAssessment indicates how participants responded to multiple choice assessment items. Knowledge Assessment is a sub-element of MedicalEducationMetrics.
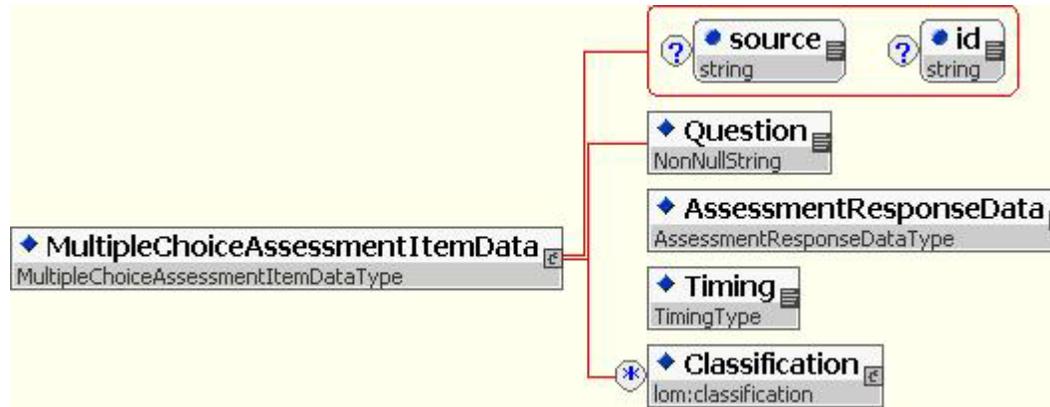

KnowledgeAssessment Information

Element	Description	Required	Multiplicity	Datatype
KnowledgeAssessment	KnowledgeAssessment is the sub-element of MedicalEducationMetrics. It contains elements that define how learners responded to a set of multiple choice assessment items.	Optional	0 or 1	Container
MultipleChoiceAssessmentItemData	MultipleChoiceAssessmentItemData is the subelement of KnowledgeAssessment. It indicates the set of responses corresponding to a single multiple choice question. See section MultipleChoiceAssessmentItemData for more information.	Optional	0 or more	Container
AssessmentScoreData	AssessmentScoreData is the subelement of KnowledgeAssessment that contains assessment scores for a particular assessment. See section AssessmentScoreData for more information.	Optional	0 or more	Container

Example:

```
<KnowledgeAssessment>
   <MultipleChoiceAssessmentItemData>
   . . .
   </MultipleChoiceAssessmentItemData>
   <MultipleChoiceAssessmentItemData>
   . . .
   </MultipleChoiceAssessmentItemData>
   <MultipleChoiceAssessmentItemData>
   . . .
   </MultipleChoiceAssessmentItemData>
   <MultipleChoiceAssessmentItemData>
   . . .
   </MultipleChoiceAssessmentItemData>
   <AssessmentScoreData>
   . . .
   </AssessmentScoreData>
   <AssessmentScoreData>
   . . .
   </AssessmentScoreData>
   <AssessmentScoreData>
   . . .
   </AssessmentScoreData>
</KnowledgeAssessment>
```

5.1 MultipleChoiceAssessmentItemData

MultipleChoiceAssessmentItem indicates how learners responded to a single multiple choice assessment item.

MultipleChoiceAssessmentItemData Information

Element	Description	Required	Multiplicity	Datatype
MultipleChoiceAssessmentItemData	MultipleChoiceAssessmentItemData is the subelement of KnowledgeAssessment. It indicates the set of responses corresponding to a single multiple choice question. MultipleChoiceAssessmentItemData has the following attributes: *source* Indicates a source vocabulary for the assessment item. *id* Indicates the item identifier in the source vocabulary referenced.	Required	0 or more	Container
Question	Question is a subelement of MultipleChoiceAssessmentItemData. It indicates the question or prompt for the assessment item.	Required	1	Non-null string

Element	Description	Required	Multiplicity	Datatype
AssessmentResponseData	AssessmentResponseData is a subelement of MultipleChoiceAssessmentItemData. It indicates the possible responses to this question and how many learners indicated each response. For more information, see section AssessmentResponseData.	Required	1	Container
Timing	Timing is a subelement of MultipleChoiceAssessmentItemData that indicates at what time in relation to the learning event this survey item was presented to the learner. Valid values are: Before, During, After. Timing has the following attribute. *duration* Indicates the amount of time before or after the learning activity the survey item was presented to the learner. For example, P1D indicates one day before or after.	Required	1	Restricted

Element	Description	Required	Multiplicity	Datatype
Classification	Classification is a subelement of MultipleChoiceAssessmentItemData that may indicate the educational objective or competency associated with this assessment item. The Classification element is defined in the Healthcare Learning Object Metadata standard defined by MedBiquitous. Please see the Healthcare Learning Object Metadata Specifications and Description document and IEEE Standard for Learning Technology-Extensible Markup Language (XML) Schema Definition Language Binding for Learning Object Metadata for more information on the sub-elements of Classification.	Optional	0 or more	Container See Healthcare Learning Object Metadata specification and healthcare lom.xsd for more information.

Example:

```
<MultipleChoiceAssessmentItemData>
    <Question>What class of medication are an appropriate treatment for asthma?</Question>
    <AssessmentResponseData>
        <AssessmentResponseItemData correct="true">
            <ResponseText>Long Acting Beta Agonists</ResponseText>
            <TotalRespondents>140</TotalRespondents>
        </AssessmentResponseItemData>
        <AssessmentResponseItemData correct="false">
            <ResponseText>Acid Reducer</ResponseText>
            <TotalRespondents>5</TotalRespondents>
        </AssessmentResponseItemData>
        <AssessmentResponseItemData correct="false">
            <ResponseText>Antibiotics</ResponseText>
            <TotalRespondents>5</TotalRespondents>
        </AssessmentResponseItemData>
    </AssessmentResponseData>
    <Timing>After</Timing>
```
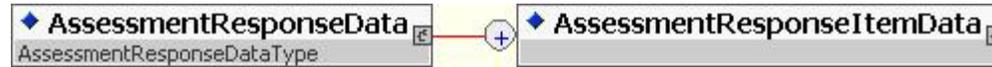
```
</MultipleChoiceAssessmentItemData>
```

5.2 AssessmentResponseData

AssessmentResponseData indicates the possible responses to a multiple choice assessment item and the number of learners that indicated each response. Multiple choice items may offer the option to choose multiple responses or one response.

AssessmentResponseData

Element	Description	Required	Multiplicity	Datatype
AssessmentResponseData	AssessmentResponseData is a subelement of MultipleChoiceAssessmentItemData. It indicates the possible responses to this question and how many learners indicated each response.	Required	1	Container
AssessmentResponseItemData	AssessmentResponseItemData is a subelement of AssessmentResponseData. Its subelements indicate a specific response option and the number of learners who gave that response. See section AssessmentResponseItemData for more information.	Required	1 or more	Container

Example:

```
<AssessmentResponseData>
    <AssessmentResponseItemData correct="true">
    . . .
    </AssessmentResponseItemData>
    <AssessmentResponseItemData correct="false">
```

```
   . . .
   </AssessmentResponseItemData>
   <AssessmentResponseItemData correct="false">
   . . .
   </AssessmentResponseItemData>
 </AssessmentResponseData>
```
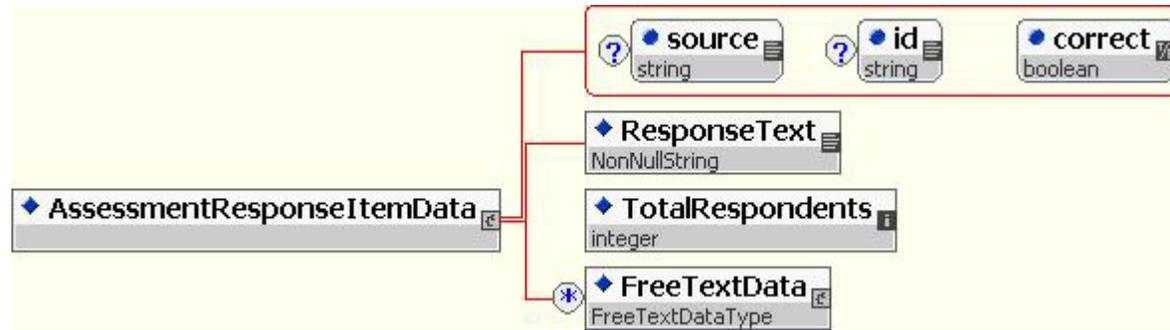
5.3 AssessmentResponseItemData

AssessmentResponseItemData indicates a specific assessment item response option and the number of learners who gave that response. It also indicates whether or not the response is correct.

AssessmentResponseItemData

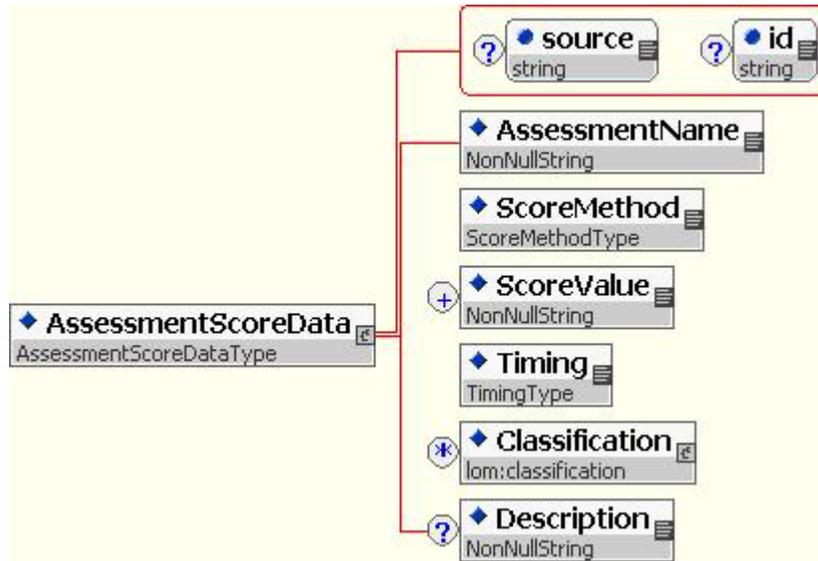| Element	Description	Required	Multiplicity	Datatype
AssessmentResponseItemData	AssessmentResponseItemData is a subelement of AssessmentResponseData. Its subelements indicate a specific response option and the number of learners who gave that response. AssessmentResponseItemData has the following attributes: *source* Indicates a source vocabulary for the assessment response item. *id* Indicates the item identifier in the source vocabulary referenced. *correct* Indicates whether or not this response item is a correct response to the question. The correct attribute is required. Valid values are true and false.	Required	1 or more	Container
ResponseText	ResponseText is a subelement of AssessmentResponseItemData. ResponseText defines the text of the response option.	Required	1	Non-null string
TotalRespondents	TotalRespondents is the subelement of AssessmentResponseItemData that indicates the number of respondents that selected this response item.	Required	1	Integer

Element	Description	Required	Multiplicity	Datatype
FreeTextData	FreeTextData is the subelement of AssessmentResponseItemData. FreeTextData is used when a multiple choice question gives respondents the option to enter their own response. See section FreeTextData for more information.	Optional	0 or more	Container

Example:

```xml
<AssessmentResponseItemData correct="true">
   <ResponseText>Long Acting Beta Agonists</ResponseText>
   <TotalRespondents>140</TotalRespondents>
</AssessmentResponseItemData>
```

5.4 AssessmentScoreData

AssessmentScoreData contains assessment scores for a particular assessment as well as the scoring method, assessment timing, and classification.

AssessmentScoreData

Element	Description	Required	Multiplicity	Datatype
AssessmentScoreData	AssessmentScoreData is the subelement of KnowledgeAssessment that contains assessment scores for a particular assessment. AssessmentScoreData has the following attributes: *source* Indicates a source vocabulary for the assessment. *id* Indicates the assessment identifier in the source vocabulary referenced.	Optional	0 or more	Container
AssessmentName	AssessmentName is the subelement of AssessmentScoreData that provides the name of the assessment instrument.	Required	1	Non-null string

Element	Description	Required	Multiplicity	Datatype
ScoreMethod	ScoreMethod leverages the TestScoreMethodType definition from the Postsecondary Electronic Standards Council's (PESC) Core Main specification version 1.5.0, which defines an XML schema for test score reporting, among other things. The following documentation and score method values defined all come from the PESC. For more information, visit http://www.pesc.org. Valid values are: Scaled, Graded, Standard, Raw, Percent, Mastery, Adjective, Stanine, Percentile, NormalCurve, Equated, Local. For definitions of score methods, please see Appendix 1.	Required	1	Restricted
ScoreValue	ScoreValue is the subelement of AssessmentScoreData that indicates one learner's score on the assessment. The score should reflect the ScoreMethod indicated. For example, if the ScoreMethod is percent, the ScoreValue is a number between 0 and 100.	Required	1 or more	Non-null string
Timing	Timing is the subelement of AssessmentScoreData that indicates at what time in relation to the learning event this assessment was presented to the learner. Valid values are: Before, During, After. Timing has the following attribute. *duration* Indicates the amount of time before or after the learning activity the survey item was presented to the learner.	Required	1	Restricted

Element	Description	Required	Multiplicity	Datatype
Classification	Classification is a subelement of AssessmentScoreData that may indicate the educational objective or competency associated with this assessment. The Classification element is defined in the Healthcare Learning Object Metadata standard defined by MedBiquitous. Please see the Healthcare Learning Object Metadata Specifications and Description document and IEEE Standard for Learning Technology-Extensible Markup Language (XML) Schema Definition Language Binding for Learning Object Metadata for more information on the sub-elements of Classification.	Optional	0 or more	Container See Healthcare Learning Object Metadata specification and healthcare lom.xsd for more information.
Description	Description is a subelement of AssessmentScoreData that contains further information about the assessment. If the ScoreMethod is Local, the local method may be defined in the description.	Optional	0 or 1	Non-null string

Example:

```
<AssessmentScoreData>
   <AssessmentName>MySite Asthma Treatment Assessment</AssessmentName>
   <ScoreMethod>Percent</ScoreMethod>
   <ScoreValue>90</ScoreValue>
   <Timing duration="P30D">After</Timing>
</AssessmentScoreData>
```
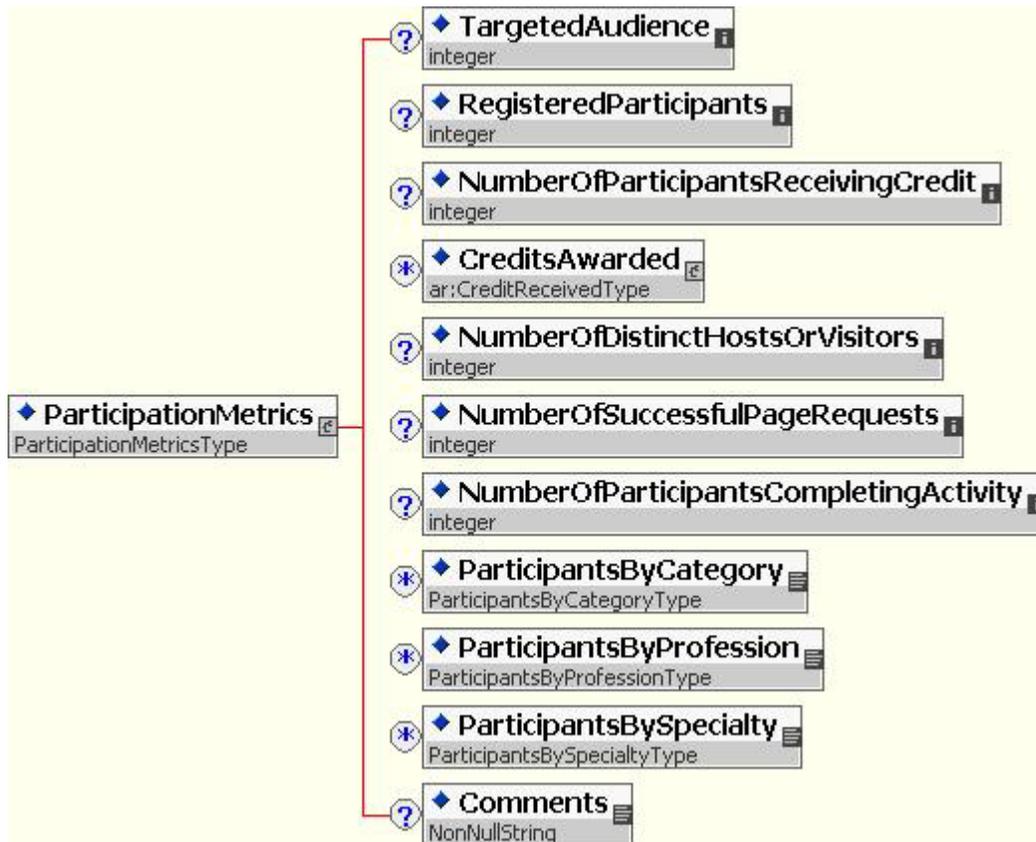
6 *ParticipationMetrics*

ParticipationMetrics defines how many participants participated in the educational activity, including how many CE credits were awarded. ParticipationMetrics is a sub-element of MedicalEducationMetrics.

ParticipationMetrics Information

Element	Description	Required	Multiplicity	Datatype
ParticipationMetrics	ParticipationMetrics is the sub-element of MedicalEducationMetrics. It contains elements that provide data on the number of learners participating in the activity and the extent of their participation.	Required	1	Container
TargetedAudience	TagetedAudience is the sub-element of ParticipationMetrics. It defines how many clinicians received promotional materials for this educational activity or were otherwise targeted to participate in the activity.	Optional	0 or 1	Integer
RegisteredParticipants	RegisteredParticipants is the sub-element of ParticiationMetrics. It defines how many clinicians registered to participate in the educational activity.	Optional	0 or 1	Integer
NumberOfParticipantsReceivingCredit	NumberOfParticipantsReceivingCredit is the sub-element of ParticipationMetrics. It defines the number of participants that received continuing education credits for participating in this activity.	Optional	0 or 1	Integer

Element	Description	Required	Multiplicity	Datatype
CreditsAwarded	CreditsAwarded is the sub-element of ParticipationMetrics. It defines the number of credits and type of credit awarded for an educational activity. Activities often are eligible for several different types of credit; to reflect this practice, the CreditsAwarded element is repeatable. CreditsAwarded uses the CreditReceivedType type definition from the Activity Report specification. Please see the description of CreditRecieved in this document for more information on the datatype.	Optional	0 or more	Container CreditsType See MedBiquitous Activity Report Specifications and Description Document and Healthcare Learning Object Metadata specification and corresponding xml schemas for more information.
NumberOfDistinctHostsOrVisitors	NumberOfDistinctHostsOrVisitors is the sub-element of ParticipationMetrics. It defines how many different computers have requested pages in the online course or resource. Web server reporting software keeps track of these statistics.	Optional	0 or 1	Integer
NumberOfSuccessfulPageRequests	NumberOfSuccessfulPageRequests is the sub-element of ParticipationMetrics. It defines the number of requests for pages in the course or resource. Web server reporting software keeps track of these statistics.	Optional	0 or 1	Integer

Element	Description	Required	Multiplicity	Datatype
NumberOfParticipantsCompletingActivity	NumberOfParticipantsCompletingActivity is the sub-element of ParticipationMetrics. It defines how many individuals completed the course or activity. Learning management systems and other technologies allow educators to track a learner's progress through an online course. Educators may have other criteria for determining if an activity has been completed.	Optional	0 or 1	Integer
ParticipantsByCategory	ParticipantsByCategory is the sub-element of ParticipationMetrics. It defines the number of participants by category. ParticipantsByCategory has the following attribute: *category* Indicates the participant category described.	Optional	0 or more	Integer
ParticipantsByProfession	ParticipantsByProfession is the sub-element of ParticipationMetrics. It defines the number of participants by profession. ParticipantsByProfession has the following attribute: *profession* Indicates the profession described. See Healthcare Learning Object Metadata Specification for a hierarchical list of recommended values for profession.	Optional	0 or more	Integer

Element	Description	Required	Multiplicity	Datatype
ParticipantsBySpecialty	ParticipantsBySpecialty is the sub-element of ParticipationMetrics. It defines the number of participants by specialty. ParticipantsBySpecialty has the following attribute: *specialty* Indicates the specialty described. See Healthcare Learning Object Metadata Specification for a list of recommended values for specialty.	Optional	0 or more	Integer
Comments	Comments is a sub-elelement of ParticipationMetrics. It allows activity providers to provide comments or further explanation regarding any of the participation metrics.	Optional	0 or 1	NonNullString

Example:

```
<ParticipationMetrics>
    <TargetedAudience>1000</TargetedAudience>
    <RegisteredParticipants>200</RegisteredParticipants>
    <NumberOfParticipantsReceivingCredit>
     150
    </NumberOfParticipantsReceivingCredit>
    <CreditsAwarded>
        <hx:creditType>CME</hx:creditType>
        <hx:numberOfCredits>150</hx:numberOfCredits>
    </CreditsAwarded>
    <NumberOfDistinctHostsOrVisitors>250</NumberOfDistinctHostsOrVisitors>
    <NumberOfSuccessfulPageRequests>500</NumberOfSuccessfulPageRequests>
    <NumberOfParticipantsCompletingActivity>
     150
    </NumberOfParticipantsCompletingActivity>
    <ParticipantsBySpecialty specialty="radiology-diagnostic">
     100
    </ParticipantsBySpecialty>
    <ParticipantsBySpecialty specialty="radiation oncology">
     50
    </ParticipantsBySpecialty>
</ParticipationMetrics>
```
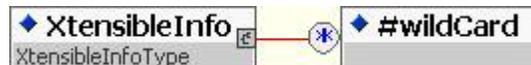
7 XtensibleInfo

The XtensibleInfo element contains sub-elements defined by the organization implementing the schema. It extends the currently defined schema. Elements listed in XtensibleInfo may be candidates for inclusion in a revision of Medical Education Metrics. We encourage submission of these ideas to the MedBiquitous Metrics Working Group. The group's home page is located at http://www.medbiq.org/working_groups/metrics/index.html. You can also submit suggestions to info@medbiq.org.

XtensibleInfo is a sub-element of MedicalEducationMetrics.

References

ANSI/MEDBIQ LO.10.1-2008 Healthcare Learning Object Metadata Specifications and Description Document,
http://www.medbiq.org/working_groups/learning_objects/HealthcareLOMSpecification.pdf

MedBiquitous Activity Report Specifications and Description Document,
http://www.medbiq.org/working_groups/activity_report/ActivityReportSpecification.pdf

MedBiquitous XML Schema Design Guidelines v1.3,
http://www.medbiq.org/technology/tech_architecture/xmldesignguidelines.pdf

Postsecondary Electronic Standards Council Core Main version 1.5.0,
http://www.pesc.org/interior.php?page_id=181

SCORM Content Aggregation Model, http://www.adlnet.gov/scorm/index.cfm

W3C Extensible Markup Language (XML) 1.0 (Fourth Edition), http://www.w3.org/TR/xml

Appendix 1: Score Method Definitions

ScoreMethodType leverages the TestScoreMethodType definition from the Postsecondary Electronic Standards Council's (PESC) Core Main specification version 1.5.0, which defines an XML schema for test score reporting, among other things. The following documentation uses the score method values as defined by PESC. Where PESC does not provide definition, MedBiquitous has added definitions (Stanine and Percentile). For more information on PESC, visit http://www.pesc.org.

Method	Definition
Scaled	Scaled Score
Grade	Grade Equivalent or Grade Level Indicator
Standard	Standard Score
Raw	Raw Score
Percent	Percent of Items Correct
Mastery Score	Mastery Score
Adjective	Adjective Classification or Locally Defined Score
Stanine	Score on a nine-point standard scale, where the mean score is 5
Percentile	Percentile Score, indicating the percentage of scores falling below the given score
NormalCurve	Normal Curve Equivalent
Equated	Equated Score (pre-test and post-test were different)
Local	Locally Defined

Appendix 2: Sample XML Document

```xml
<?xml version="1.0" encoding="UTF-8"?>
<MedicalEducationMetrics xmlns="http://ns.medbiq.org/metrics/v1/"
xmlns:lom="http://ltsc.ieee.org/xsd/LOM"
xmlns:ex="http://ltsc.ieee.org/xsd/LOM/extend"
xmlns:ag="http://ltsc.ieee.org/xsd/LOM/unique"
xmlns:voc="http://ltsc.ieee.org/xsd/LOM/vocab"
xmlns:a="http://ns.medbiq.org/address/v1/"
xmlns:hx="http://ns.medbiq.org/lom/extend/v1/"
xmlns:hv="http://ns.medbiq.org/lom/vocab/v1/"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://ns.medbiq.org/metrics/v1/://ns.medbiq.org/metrics/
v1/medicaleducationmetrics.xsd">
   <ReportDescription>
      <ReportingStartDate>2008-01-01</ReportingStartDate>
      <ReportingEndDate>2008-03-31</ReportingEndDate>
   </ReportDescription>
   <ActivityDescription>
      <lom:lom>
         <lom:general>
            <lom:identifier>
               <lom:catalog>URI</lom:catalog>

   <lom:entry>https://www2.mysite.org/TNT_products.cfm?prod=COD77</lom:entry>
            </lom:identifier>
            <lom:title>
               <lom:string>Case of the Day, May 2007</lom:string>
            </lom:title>
            <lom:language>en</lom:language>
            <lom:description>
               <lom:string>An introduction to breast imaging. Learning
Objectives: 1) Identify, characterize, and analyze abnormal findings on
multimodality breast imaging studies. </lom:string>
            </lom:description>
            <lom:keyword id="D001940" source="MeSH">
               <lom:string>breast</lom:string>
            </lom:keyword>
            <lom:keyword id="D003952" source="MeSH" >
               <lom:string>diagnostic imaging</lom:string>
            </lom:keyword>
         </lom:general>
         <hx:healthcareMetadata>
            <hx:healthcareEducation>
               <hx:expirationDate>2010-07-19</hx:expirationDate>
               <hx:creditsAvailable>yes</hx:creditsAvailable>
               <hx:credits>
                  <hx:accreditingBody>ACCME</hx:accreditingBody>
                  <hx:activityCertification>AMA PRA category
1</hx:activityCertification>
                  <hx:creditType>CME</hx:creditType>
                  <hx:creditUnit>Credit</hx:creditUnit>
                  <hx:numberOfCredits>1</hx:numberOfCredits>
               </hx:credits>
```

```xml
                <hx:participationModality>technology
based</hx:participationModality>
            </hx:healthcareEducation>
        </hx:healthcareMetadata>
    </lom:lom>
    <CommercialSupportAmount currency="USD" supportSource="SeeRite Imaging
Company">5000</CommercialSupportAmount>
    <AdvertisingAndExhibitIncome>0</AdvertisingAndExhibitIncome>
    <OtherIncome currency="USD">5400</OtherIncome>
    <Expenses currency="USD">9550</Expenses>
    <DesignedToChangeCompetence>true</DesignedToChangeCompetence>
    <DesignedToChangePerformance>false</DesignedToChangePerformance>

  <DesignedToChangePatientOutcomes>false</DesignedToChangePatientOutcomes>
    <ChangesInCompetenceMeasured>true</ChangesInCompetenceMeasured>
    <ChangesInPerformanceMeasured>false</ChangesInPerformanceMeasured>

  <ChangesInPatientOutcomesMeasured>false</ChangesInPatientOutcomesMeasured>
  </ActivityDescription>
  <ParticipantActivityEvaluation>
    <SurveyItemData>
        <SurveyQuestion>The course met its stated learning
objectives</SurveyQuestion>
        <ResponseData>
            <ScaleData type="likert" points="5">
                <One label="Strongly Agree">100</One>
                <Two>40</Two>
                <Three>10</Three>
                <Four>0</Four>
                <Five label="Strongly Disagree">0</Five>
            </ScaleData>
        </ResponseData>
    </SurveyItemData>
    <SurveyItemData>
        <SurveyQuestion>Did the course present a balanced view of clinical
options?</SurveyQuestion>
        <ResponseData>
            <YesNoData>
                <Yes>140</Yes>
                <No>10</No>
            </YesNoData>
        </ResponseData>
    </SurveyItemData>
    <SurveyItemData>
        <SurveyQuestion>How many years have you been in
practice?</SurveyQuestion>
        <ResponseData>
            <MultipleChoiceSelectOneData>
                <ResponseItemData>
                    <ResponseText>less than 5 years</ResponseText>
                    <TotalRespondents>20</TotalRespondents>
                </ResponseItemData>
                <ResponseItemData>
                    <ResponseText>5-10 years</ResponseText>
                    <TotalRespondents>50</TotalRespondents>
                </ResponseItemData>
                <ResponseItemData>
```

```xml
                    <ResponseText>10-20 years</ResponseText>
                    <TotalRespondents>70</TotalRespondents>
                </ResponseItemData>
                <ResponseItemData>
                    <ResponseText>more than 20 years</ResponseText>
                    <TotalRespondents>20</TotalRespondents>
                </ResponseItemData>
            </MultipleChoiceSelectOneData>
        </ResponseData>
    </SurveyItemData>
    <SurveyItemData>
        <SurveyQuestion>What factors influenced you to attend this
program?</SurveyQuestion>
        <ResponseData>
            <MultipleChoiceSelectManyData>
                <ResponseItemData>
                    <ResponseText>Course description</ResponseText>
                    <TotalRespondents>40</TotalRespondents>
                </ResponseItemData>
                <ResponseItemData>
                    <ResponseText>List of faculty</ResponseText>
                    <TotalRespondents>60</TotalRespondents>
                </ResponseItemData>
                <ResponseItemData>
                    <ResponseText>Host city</ResponseText>
                    <TotalRespondents>50</TotalRespondents>
                </ResponseItemData>
            </MultipleChoiceSelectManyData>
        </ResponseData>
    </SurveyItemData>
    <SurveyItemData>
        <SurveyQuestion>If there were one thing you would change about the
program, what would it be?</SurveyQuestion>
        <ResponseData>
            <FreeTextData>
                <TextResponse>Great conference - wouldn't change a
thing.</TextResponse>
                <AnalysisCategory>Positive comment</AnalysisCategory>
            </FreeTextData>
            <FreeTextData>
                <TextResponse>Longer lunch for networking.</TextResponse>
                <AnalysisCategory>Logistics</AnalysisCategory>
            </FreeTextData>
            <FreeTextData>
                <TextResponse>Different faculty - we see the same faces every
year.</TextResponse>
                <AnalysisCategory>Faculty</AnalysisCategory>
            </FreeTextData>
            <FreeTextData>
                <TextResponse>Can we start later in the day?</TextResponse>
                <AnalysisCategory>Logistics</AnalysisCategory>
            </FreeTextData>
        </ResponseData>
    </SurveyItemData>
    <ComparisonData>
        <SurveyItemDataForComparison>
```

```xml
            <SurveyQuestion>Thinking about my expectations for this CME
activity, it is important  that it address my most pressing questions.
</SurveyQuestion>
            <ResponseData>
               <ScaleData type="low/high" points="5">
                  <One label="Low">5</One>
                  <Two>15</Two>
                  <Three>35</Three>
                  <Four>70</Four>
                  <Five label="High">25</Five>
               </ScaleData>
            </ResponseData>
            <Timing duration="P1D">Before</Timing>
         </SurveyItemDataForComparison>
         <SurveyItemDataForComparison>
            <SurveyQuestion>Thinking about  my participation in this CME
activity, I thought it was able to address my most pressing questions.
</SurveyQuestion>
            <ResponseData>
               <ScaleData type="minimally/completely" points="5">
                  <One label="Minimally">5</One>
                  <Two>10</Two>
                  <Three>30</Three>
                  <Four>75</Four>
                  <Five label="Completely">30</Five>
               </ScaleData>
            </ResponseData>
            <Timing duration="P1D">After</Timing>
         </SurveyItemDataForComparison>
      </ComparisonData>
   </ParticipantActivityEvaluation>
   <KnowledgeAssessment>
      <MultipleChoiceAssessmentItemData>
         <Question>What class of medication are an appropriate treatment for
asthma?</Question>
         <AssessmentResponseData>
            <AssessmentResponseItemData correct="true">
               <ResponseText>Long Acting Beta Agonists</ResponseText>
               <TotalRespondents>140</TotalRespondents>
            </AssessmentResponseItemData>
            <AssessmentResponseItemData correct="false">
               <ResponseText>Acid Reducer</ResponseText>
               <TotalRespondents>5</TotalRespondents>
            </AssessmentResponseItemData>
            <AssessmentResponseItemData correct="false">
               <ResponseText>Antibiotics</ResponseText>
               <TotalRespondents>5</TotalRespondents>
            </AssessmentResponseItemData>
         </AssessmentResponseData>
         <Timing>After</Timing>
      </MultipleChoiceAssessmentItemData>
      <AssessmentScoreData>
         <AssessmentName>MySite Asthma Treatment Assessment</AssessmentName>
         <ScoreMethod>Percent</ScoreMethod>
         <ScoreValue>90</ScoreValue>
         <Timing duration="P30D">After</Timing>
      </AssessmentScoreData>
```

```xml
    </KnowledgeAssessment>
    <ParticipationMetrics>
        <TargetedAudience>1000</TargetedAudience>
        <RegisteredParticipants>200</RegisteredParticipants>

    <NumberOfParticipantsReceivingCredit>150</NumberOfParticipantsReceivingCre
dit>
        <CreditsAwarded>
            <hx:creditType>CME</hx:creditType>
            <hx:numberOfCredits>150</hx:numberOfCredits>
        </CreditsAwarded>
        <NumberOfDistinctHostsOrVisitors>250</NumberOfDistinctHostsOrVisitors>
        <NumberOfSuccessfulPageRequests>500</NumberOfSuccessfulPageRequests>

    <NumberOfParticipantsCompletingActivity>150</NumberOfParticipantsCompletin
gActivity>
        <ParticipantsBySpecialty specialty="radiology-
diagnostic">100</ParticipantsBySpecialty>
        <ParticipantsBySpecialty specialty="radiation
oncology">50</ParticipantsBySpecialty>
    </ParticipationMetrics>
</MedicalEducationMetrics>
```