Service Description: Curriculum-Alignment Analysis

This Service Description describes the Services IBM will provide to the Client.

Service Description.

IBM helps school districts understand the extent of alignment of their digitized educational curricula. A digitized, aligned curriculum is an essential prerequisite to adoption of emerging Artificial-Intelligence (AI) technologies such as Watson-Education Mastery. Watson-Education Mastery supports at-scale management of competency-based personalized learning or differentiated instruction.

IBM produces curriculum-alignment indicators from a school-district client’s digitized curriculum. We show supervisor, curriculum, and assessment indicators enterprise-level views of extent to which their digital curriculum is in fact aligned. This insight gives school-district leaders confidence both that their learning environment consistently affords individual students the greatest-practical Opportunity to Learn, as well as their readiness to adopt new technologies, such as AI-assisted, at-scale management of differentiated instruction or personalized learning.

IBM’s curriculum-alignment analysis provides the following outcomes.

1. Detailed and executive-level analysis and visualizations of the extent of alignment of the school district’s digitized curriculum for the agreed-to scope of analysis.
2. Precise, high-confidence insight into the extent to which the school district’s curriculum system maximizes students’ Opportunity to Learn (OTL), and the district’s readiness to adopt frameworks curriculum frameworks based on AI-assisted, at-scale management of differentiated instruction or personalized learning.
3. Access to IBM Watson-Education’s *Curriculum-Management Tool*, a web-based application by which curriculum administrators build course blueprints in terms of learning standards.
4. Components of a digitized curriculum — including learning standards, course blueprints — in an open, relationally-consistent form.
5. Completion of significant portions of preparation to implement IBM Watson-Education Mastery — an AI-assistive solution for at-scale management of differentiated instruction or personalized learning — within the courses analyzed during this study.
6. A recommended plan for adoption of Watson-Education Mastery by the school district for the courses within the scope of analysis.

Definitions.

**Aligned Curriculum**. A Curriculum, Instruction, Assessments (CIA) framework within which instructional goals, materials, and measurements are explicitly articulated in terms of system-wide, consistent knowledge, skills, and indicators (<http://ibm.biz/Porter-Curric-Indicators>). In U.S. K-12 education, these desired outcomes are largely specified in terms of educational learning standards. IBM Watson Education contains for most U.S. states’ sets of educational learning standards in a digitized format.

**Competency-Based Learning**. “…a system of education, often referred to as proficiency- or mastery-based, in which students advance and move ahead on their lessons based on demonstration of mastery. In order for students to progress at a meaningful pace, schools and teachers provide differentiated instruction and support.” (<http://ibm.biz/NCSL_Comp_Learning>)

**Curriculum-Alignment Indicators**. Quantitative characterization (e.g., <http://ibm.biz/Porter-Curric-Indicators>) of the extent to which an educational curriculum is *aligned*. In an aligned curriculum, the learning objectives — knowledge, skills, abilities — specified by policy explicitly guide instructional delivery and education measurements. In U.S. K-12 education, knowledge, skills, and abilities are extensively articulated in terms of learning standards.

**Curriculum Map**. The instructional scope in terms of instructional units and learning standards for an academic course (for illustration, see <http://ibm.biz/Engage_NY>). Also referred to as “course blueprint”, “scope and sequence”, “year at a glance”, etc.

**Differentiated Instruction**. A style for the management of classroom instruction by which teachers “…engage students in instruction through different approaches to learning, by appealing to a range of interests, and by using varied rates of instruction along with varied degrees of complexity and differing support systems.” (<http://ibm.biz/ASCD_Diff_CR_Book>)

**Digitized Curriculum**. The condition in which the CIA framework is captured in a homogenous, machine-processible format (for illustration, see <http://ibm.biz/ETS_ECD_TraceFile>) so that distinct aligned facets can be employed for artificial-intelligence purposes.

**Learning-Standard Progressions**. "What students can learn at any particular grade level depends upon what they have learned before. Ideally then, each «learning» standard ... «should be» phrased in the form, 'Students who already know ... should next come to learn ...' (<http://ibm.biz/CCSS-Math>)." “Learning progressions describe how students gain more expertise within a discipline over a period of time. They represent not only how knowledge and understanding develops, but also predict how the knowledge builds over time. Thus, the focus is not limited on the end-product knowledge as characterized by summative assessment, but on how students’ ideas build upon other ideas (<http://ibm.biz/CHICCCE-Progressions)>.” Also referred to as “vertical articulation”, “vertical alignment”, “coherence map”, etc. Learning-standard progressions are a foundational tool in Watson-Education Mastery’s AI-assistive, at-scale management of differentiated instruction and personalized learning.

IBM Watson Education has “out-of-the-box” learning-standard progressions for the following learning-standard regimes:

1. Common-Core State Standards for Math;
2. Common-Core State Standards for English, Language Arts, and Reading (ELAR); and
3. Partial set of Next-Generation Science Standard (NGSS) Disciplinary Core Ideas (DCIs).

**Opportunity to Learn** (OTL). “…inputs and processes within a school context necessary for producing student achievement of intended outcomes (<http://ibm.biz/Oxford-Hbk-OTL>).”

**Personalized Learning**. A CIA structure “…that creates flexibility, allows students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning. Competency-based strategies provide flexibility in the way that credit can be earned or awarded, and provide students with personalized learning opportunities.” (<http://ibm.biz/US_DoEd_Comp_Pers_Learn>)

**Standards-Aligned Evidence of Learning**. An instrument, system, or set of methods for digital collection of evidence of learning by individual students with respect to distinct learning standards. This includes "...evidence gathered through a variety of formal and informal assessments during a unit of study or a course … «including» traditional quizzes and tests, performance tasks and projects, observations and dialogues, as well as students’ self-assessments gathered over time." (<http://ibm.biz/ASCD_UBD_Book>).

IBM Responsibilities.

In executing this Order, IBM undertakes the following activities.

* 1. IBM Curriculum-Alignment Analysis

IBM administers a Curriculum-Alignment Analysis study involving up to three school-district participants whose responsibilities span the curriculum and assessments CIA domains. Expected school-district stakeholder representation includes a Supervisory Administrator, a Curriculum Administrator, an Assessments Administrator, and an Education-Technology Systems Administrator. IBM accomplishes the following tasks.

* + 1. Configure secure data-sharing services by which the school district can securely provide essential data required for the curriculum-indicators analysis.
    2. Configure the Watson-Education *Curriculum-Management* tool for use by the school district in digitizing its course blueprints into Watson-compatible formats.
    3. Perform data manipulations required for the Curriculum-Alignment analysis. The following data are processed:
       1. Course blueprints for courses within the scope of the analysis;
       2. Student enrollment in and teacher assignments to courses and sections within the analysis scope;
       3. Assessments-data extracts containing enrolled students’ proficiency measurements with respect to individual learning standards; and
       4. Learning-standard progressions based on the learning standards in the course blueprints.
    4. Perform analysis to generate curriculum-alignment indicators. Alignment indicators for in-scope courses include the following:
       1. Course-blueprint alignment to learning-standard progressions answer;
       2. Evidence-of-learning alignment to course blueprints; and
       3. Evidentiary coverage of both the course blueprints and the learning-standard progressions.

A complete set of curriculum indicators requires that course blueprints, learning-standard progressions, and learning-standard-aligned evidence of learning for all of the courses within the scope of this analysis.

* + 1. Develop a plan for implementation of Watson Education Mastery AI-assisted framework for at-scale management of personalized learning or differentiated instruction for the in-scope courses analyzed during this task.
    2. Prepare final report and deliver final briefing to the designated Supervisory Administrator, Curriculum Administrator, and Assessments Administrator.

1. IBM begins Curriculum-Alignment Analysis and schedules the final review when the following conditions are satisfied.
   * + - 1. A mutually-agreeable Non-Disclosure Agreement (NDA) has been executed that allows IBM to receive, store, and process in its corporate systems data required for the completion of the analysis.
         2. The supervisory administrator designated to represent the school district to IBM has articulated in writing the scope of curriculum-alignment analysis in terms of courses, subjects, and grades.
         3. IBM has configured secure information-sharing mechanism by which the school district can pass to IBM data required for purposes of this analysis.
         4. The school district has provided IBM all essential data needed to generate the curriculum-alignment indicators. These include:

Digitized course blueprints in an IBM-specified format;

Comma-separated-variable (csv)-format tables containing student-enrollment and teacher-responsibility information for courses, sections within scope of the analysis;

Exports from one assessment-data source system containing individual students’ proficiency measurements with respect to distinct learning standards for academic courses within the scope of this analysis;

Cross-reference table between learning-standard codes employed by the assessment-data source system and learning-standard codes employed by IBM Watson-Education solutions; and

Learning-standard progressions, if the district has its own set.

If the school district does not have its own learning-standard progressions, IBM encourages that it familiarize itself with those within Watson Education’s offerings.

This workshop will be complete when the Report of Curriculum Alignment has been delivered to and reviewed with your designated Supervisory Administrator.

1. Report of Curriculum Alignment. A summary report of the findings of the workshop including:

* High-level visualization of the extent of curriculum alignment and evidentiary coverage across the in-scope courses;
* Executive-level summary of curriculum readiness for AI-assisted management of differentiated instruction or personalized learning; and
* Recommended plan for adoption of Watson Education Mastery AI-assisted framework for at-scale management of differentiated instruction or personalized learning.

Your Responsibilities.

Your Supervisory Administrator.

You will designate a Supervisory Administrator to communicate with IBM and act on your behalf regarding this workshop. Your Supervisory Administrator’s responsibilities include the following.

* + - * 1. Specify the curricular scope of the curriculum-indicators analysis. Articulate in terms of subject level, course, learning-standards grade level.
        2. Coordinate the assembly of information, data, and decisions within three working days of IBM's request unless you and IBM agree in writing to a different response time.
        3. Receive and accept the final deliverable.
        4. Review with the IBM Curriculum-Alignment expert any of your invoice or billing requirements. Such requirements that deviate from IBM's standard invoice format or billing procedures may affect price.

Your Curriculum Administrator.

You will designate a Curriculum Administrator to communicate with IBM and act on your behalf regarding this workshop. The Curriculum Administrator represents and provides documents regarding school-district policies about the structure and scope of academic courses throughout the system. Your Curriculum Administrator 's responsibilities are delineated in the following.

* + - * 1. Employ IBM Watson’s *Curriculum-Management Tool* to digitize the curriculum maps for courses within the scope of this analysis. (Option: IBM can, under a separate task at additional cost, digitize curriculum maps pertaining to the courses within scope of this study).
        2. Provide learning-standard progressions employed by the school district, if used. Otherwise, review and understand the learning-standard progressions employed within IBM Watson.

Your Assessments Administrator.

You will designate an Assessments Administrator to communicate with IBM and act on your behalf regarding this workshop. The Assessments Administrator represents and provides documents regarding client-organization policies about assessing student progress, particularly with respect to standards-aligned evidence of learning. Your Assessments Administrator 's responsibilities are delineated in the following.

* + - * 1. Identify the assessments containing individual students’ proficiency with respect to distinct learning standards on which the alignment analysis is based. Coordinate with the Education-Technologies Systems Administrator to get these data extracted from the data-system by which the school district collects and manages them.
        2. Employ IBM Watson’s *Curriculum Management Tool* to develop a cross-mapping between learning-standards against which individual-student proficiency measurements in the assessments-data system are recorded, and those used by Watson Education. (Option: IBM can, under a separate task at additional cost, produce the cross-mapping between the learning-standard codes in the assessments data system and those employed by Watson Education.)

Your Education-Technologies Systems Administrator.

You will designate an Education-Technology Systems Administrator (ETSA) to support this analysis. The ETSA effects delivery to IBM via agreed-to, secure services of data employed in the Curriculum-Alignment Analysis. Your ETSA performs the following activities in support of this curriculum-alignment analysis.

* + - * 1. Extract student-enrollment and teacher-assignment data from the Student Information System (SIS) for the in-scope courses. Provide the data to IBM in a csv-file format via the secure data-delivery channel established for this alignment analysis.
        2. Extract individual students’ proficiency measurements with respect to distinct learning standards for students enrolled in the in-scope courses and assessments identified by the Assessments Administrator. Consult with IBM on the contents of the extracts to ensure they contain the essential information needed by IBM to derive the curriculum-alignment indicators. Submit these data in csv-file format via the secure data-delivery channel established for this alignment analysis. Advise IBM on the structure of these data.

Your Other Responsibilities

You will fulfill the following responsibilities.

* + - * 1. Obtain any approvals and enable access necessary for IBM to access and use your resources and systems to the extent necessary for IBM to provide the Services.
        2. Sign a mutually-agreeable Non-Disclosure Agreement (NDA) allowing IBM to store and process student and curriculum data on its corporate systems. These data include student
        3. Make suitable staff, information, and materials available as IBM reasonably requires. IBM will not be liable for any damage or delay arising from inaccurate, incomplete, or otherwise defective information and materials supplied by or on behalf of Client.
        4. Be responsible for agreements with, management of, and the input and work of third parties whose work may affect IBM’s ability to provide the Services. Except to the extent IBM specifically agrees otherwise in this Service Description, Client is solely responsible for any third-party hardware, software or communications equipment used in connection with the Services.
        5. Be responsible for the content of any database, the selection and implementation of controls on its access and use, backup and recovery and the security of the stored data. This security will also include any procedures necessary to safeguard the integrity and security of software and data used in the Services from access by unauthorized personnel.
        6. Ensure that IBM is not exposed in performance of the Services to any US regulated data (whether HIPAA, FFIEC or other), any Canadian regulated data (whether PIPEDA or local province regulated health data or other) or any other Personally Identifiable Information (PII) originating from and regulated by any country outside the United States or Canada, beyond what is permitted under the NDA.
        7. School-District participants of the IBM Curriculum-Survey Workshop must include:

Supervisory Administrator;

Curriculum Administrator; and

Assessments Administrator.

* + - * 1. All participants of the Curriculum-Survey Workshop session must actively engage in the analysis and assist in evaluating the school district’s curriculum in terms of AI-adoption readiness criteria.

Estimated Schedule.

The Estimated Start Date for these services will be on or after the date of mutual contract execution, as agreed between the parties. The Estimated End Date will be 45 days after the date of mutual contract execution. Estimated Start and End Dates may be agreed by email between the parties.

Deliverables.

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| **Deliverable** | **Deliverable Type** |
| Report of Curriculum-Alignment Analysis — Digital format. | Project Materials |

In the event a deliverable is inadvertently omitted from the list above, IBM will notify Client of the identity and the appropriate designation of the deliverable.

Completion Criteria.

IBM will have fulfilled its obligations under this Order when any one of the following first occurs:

* + - 1. IBM completes the IBM responsibilities, including submission of the deliverables, to the designated Supervisory Administrator; or
      2. The Services are terminated in accordance with the provisions of this Order and the Agreement.

Charges.

The Services will be conducted on a fixed price basis. The fixed price for performing the Services defined in this Service Description will be $13,000.00. This fixed price is exclusive of any travel and living expenses and other reasonable expenses incurred in connection with the Services. All charges are exclusive of any applicable taxes.

Travel and living expenses are not expected. Should any travel to your facility under this Service Description be required, estimated travel and living expenses will be paid by you and will be authorized through a Project Change Request (PCR).

IBM will invoice you monthly for the Services performed in equal monthly amounts over the period of the performance specified in the “Estimated Schedule” section, plus applicable taxes, travel and living expenses, and other reasonable expenses incurred in connection with the Services

Following execution of this agreement IBM may perform a credit check on you within 90 days. IBM reserves the right to terminate this agreement without liability if you do not pass this credit check (as determined in IBM's sole discretion).