

**Mercer Island School District #400  
Board of Directors Meeting**

**August 28, 2014**

**WORK AND DELIBERATION**

Monitoring of Fundamental 5 – Develop 21<sup>st</sup> Century Thinking and Process Skills

*Fundamental 5: Develop 21<sup>st</sup> Century Thinking and Process Skills such as critical thinking, cross-discipline thinking, creativity, innovation, collaboration, communication, problem solving, and information and technology literacy in curriculum design.*

**BACKGROUND AND FACTS:**

The administrative team is committed to implementation of the 2020 Vision including the six fundamentals. The following will explain the work being done in our schools to meet Fundamental 5 – *Develop 21<sup>st</sup> Century Thinking and Process Skills*.

The leadership team considered the superintendent’s interpretation of Fundamental 5 and based on the interpretation supported by the board, the monitoring is divided around four themes:

- Theme 1: Critical Thinking and Problem Solving
- Theme 2: Creativity and Innovation
- Theme 3: Communication and Collaboration
- Theme 4: Information and Technology Literacy in Curriculum Design

The following indicators represent a **baseline** for representative quantitative and qualitative data that are already being collected to support the monitoring of Fundamental 5.

**QUANTITATIVE INDICATORS**

Numerous quantitative factors from the Educational Effectiveness Survey were considered to highlight implementation of Fundamental 5.

Theme	Indicator	SY 13-14	SY 14-15	SY 15-15	SY 16-17	SY 17-18
<b>Theme 1 – Critical Thinking and Problem Solving</b>	% 5 <sup>th</sup> grade students who agree that “I am good at figuring out the best solution to problems I’m facing.”	79				
	% secondary students who agree that “I am good at figuring out the best solution to problems I’m facing.”	72				
	% 5 <sup>th</sup> grade students who agree that “I solve problems by first breaking them into smaller steps.”	73				
	% secondary students who agree that “I solve problems by first breaking them into smaller steps.”	66				
	% 5 <sup>th</sup> grade student who agree that “When my solution to a problem is not working, I try to figure out what went wrong.”	87				
	% secondary student who agree that “When my solution to a problem is not working, I try to figure out what went wrong.”	79				
	% elementary staff who agree that “Students are provided tasks that require higher-level thinking skills.”	64				
	% secondary staff who agree that “Students are provided tasks that require higher-level thinking skills.”	64				

	% of teachers on Comprehensive Evaluation rated proficient or distinguished in Danielson's component 3c "Engaging Student in Learning"	89				
<b>Theme 2 – Creativity and Innovation</b>	% 5 <sup>th</sup> grade students who agree "I try to think of many solutions when I have a problem"	82				
	% secondary students who agree "I try to think of many solutions when I have a problem"	70				
	% 5 <sup>th</sup> grade students who agree that "I am a creative person."	92				
	% secondary students who agree that "I am a creative person."	77				
	% 5 <sup>th</sup> grade students who agree that "I can come up with new ideas."	93				
	% secondary students who agree that "I can come up with new ideas."	81				
	% 5 <sup>th</sup> grade students who agree that "I like to imagine new ways to do things."	87				
	% secondary students who agree that "I like to imagine new ways to do things."	74				
	% of teachers on Comprehensive Evaluation rated proficient or distinguished in Danielson's component 3e "Demonstrating Flexibility and Responsiveness"	94				
<b>Theme 3 – Communication and Collaboration</b>	% 5 <sup>th</sup> grade students who agree that "My teacher(s) help us learn in more ways than just talking in front of class."	88				
	% secondary students who agree that "My teacher(s) help us learn in more ways than just talking in front of class."	64				
	% of teachers on Comprehensive Evaluation rated proficient or distinguished in Danielson's component 3b "Communicating Clearly and Accurately"	83				

These data, through representative in nature, show that students are working on experiences for students that involve critical thinking, problem solving, creativity, innovations and communication and collaboration and teachers are supporting their students with engaging learning environments, clear communication, flexibility, and responsiveness.

### QUALITATIVE INDICATORS:

The following qualitative data provides snapshots into Fundamental 5 – Develop 21<sup>st</sup> Century Thinking and Process Skills. Several but not all will be highlighted at the August 28, 2014 board meeting.

#### Theme 1: Critical Thinking and Problem Solving

- **Hess Rigor Matrix – Elementary:** As part of our transition to English Language Arts CCSS, K-5 teachers participated in several trainings about developing students' skills in close reading of texts. As part of this training, teachers learned about the Hess Rigor Matrix and how to use it to strategically build questions at different levels of complexity and rigor, pushing students' thinking not only about key ideas in a text, but also about the author's craft and the structure of a text, and how they affect meaning.
- **Elementary and IMS Robotics Clubs –** Each year in December, FLL (First Lego League) sponsors a world-wide competition with four components based around a global situation. Last year's theme was "Natural Disasters". Teams (4-8th grade) built robots designed to solve up to 14 different scenarios based on global disasters. They researched, interviewed, understood, planned, and proposed a solution to a community's possible problem - which they presented to a committee. They collaborated and presented themselves as a cohesive team throughout the competition, and finally they explained their designs of robotic functions to an engineering committee.
- **IMS Computer Programming:** All IMS students have multiple opportunities to utilize critical thinking and problem solving strategies through experiences involving computer programming. All 6<sup>th</sup> grade students are introduced to programming and a series of lessons around basic coding using the

LegoEducation Mindstorms curriculum. This unit culminates with an independent project where students model a “real world” working machine. In addition, students in 7<sup>th</sup> and 8<sup>th</sup> grade can explore computer programming in our video game programming elective. IMS has also offered ancillary programs to students such as a Code Academy club and participated in Code.org’s Day of Code in 2013.

- **MIHS School Motto** - Beginning at the MIHS ASB Leadership Retreat in August 2013, the student leaders embarked on a year-long journey to establish a school motto for MIHS. The intent was to create a motto that captures what MIHS believes in and stands for – and to do so while incorporating the opinions and ideas from all stakeholders. The students spent several months gathering feedback from staff, students, parents, and community members. They reviewed and collated the data and identified themes. Then they took the data to the staff and to focus groups, eventually coming up with the three words that best describe what MIHS is all about: **Integrity, Innovation, and Inspiration**. With the motto in place, the students then coordinated with Laura Totten and her graphic design students to engage in a motto-designing project. Each graphic design student created a logo using the motto and the logos were then voted on by students and staff. The logo and motto are now in the process of being rolled out to our school community and our hope is to achieve complete implementation by the end of this school year.

### Theme 2: Creativity and Innovation

- **Museum of Flight:** Fifth graders go to the Museum of Flight to participate in a simulation of space travel to Mars. Students must problem solve their way to the red planet by accomplishing specific missions. This activity includes prior classroom preparation where students are divided into teams: communications, data, navigation, medical, probe and life support teams. Incorporating problem solving, decision making, communication, writing, math, and reading comprehension skills, students create a mission plan that is tested for effectiveness during the simulation.
- **Destination Imagination.** The purpose of the program is to "inspire and equip students to become the next generation of innovators and leaders." The program presents students with a Challenge to tackle over several weeks. With support from coaches, students learn to imagine and innovate solutions to their challenges. They work collaboratively with their team to create, develop, and practice a solution to the challenge. They then compete in a local tournament, and, if successful, advance through tournament levels to the Global Finals. This past year, two of our teams, the West Mercer team, The Six Muskateers, and the IMS Team, The Mythical VII, both advanced to and performed well in the Global Finals.
- **8<sup>th</sup> Grade Independent Research Project:** The 8<sup>th</sup> grade science Independent Research Project (IRP) asks for a high level of creative thinking as students determine a question that is both testable and personally relevant. Students experience authentic adversity as most questions are initially rejected (not challenging enough, student already know the answer, etc.). The next layer of adversity comes as students collect data. Unlike most in-class labs, there is no procedure or scripted data table to use. Students innovate methods in the “field” (often literally the lacrosse field) and analyze, organize, and present their data.

The IRP is a practical application of research, writing, presentation, and investigation skills. Struggling learners can fully engage in the process through the selection of a simple question. Highly Capable students (whether in the program or a mainstream class) can be challenged with the selection of a more rigorous question and the encouragement to publish their results in the online Google Science

Fair. Many students report that it is their favorite assignment of the year because it is “their” work and their pride and ownership is evident in the final product.

- **High School Special Education Culinary Arts** - The Special Education Culinary Arts program began several years ago in response to teaching several independent life skills to our students. There was a need for the students’ development on so many fronts including: planning, writing lists, keeping a budget, transacting a purchase, shopping, locating items in a store, coupon shopping, finding bargains, handling money, social skills within a public setting, asking for help, riding public transportation, cooking, following a recipe, measuring, talking about nutrition, eating together and appropriate associated social skills, conversational skills, setting up, cleaning up, hygiene while cooking, etc. The Mercer Island Schools Foundation has been very generous in funding this program and we feel our students are gaining imperative life-long skills that will support their goals of independent living in the future.
- **Crest Student Designed Independent Reading Projects** - Crest students read self-selected books that challenge their reading abilities. The learning outcomes of the unit are directly related to Bloom's Taxonomy. Students choose between a variety of options to demonstrate Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. Each level of understanding has a variety of options, some are written, some are artistic, and some are creative. After reading RL Stevenson's *Treasure Island*, one student handed in a crossword puzzle of new words learned, a bookmark based on the book, a series of drawings that showed what he thought the characters’ attire would have looked like, a board game that followed the plot of the book (which several classmates played with him), a movie poster and movie review (including the selection of actors for the characters and the director) and an analytical essay comparing piracy in the novel and Somalia. Rubrics are developed by the students and teacher in collaboration as the projects are being dreamt and then they are assessed by both at the completion of the unit.

### Theme 3: Communication and Collaboration

- **Math Talk in K-5 Mathematics Instruction.** Math Talk is a research-based structure used in every classroom to support students in developing their ability to share their strategies for problem solving, describe and justify their thinking, and engage in student-to-student discourse about mathematics. In Math Talk, teachers provide a routine in which students solve mathematics problems, individually, in partners, or in small groups, and share their solutions and solution strategies with the class. Other students listen, ask clarifying questions, and provide feedback, with scaffolding and support from the teacher as needed. Teachers can capitalize on errors and creative solution paths to address misconceptions and enhance everyone’s learning.
- **Writer's Workshop.** The instructional strategies and practices in Writer's Workshop develop students’ oral and written communication and collaboration skills. The architecture of the daily Writer's Workshop Mini-lesson always includes a section called "Active Engagement". In this portion of the lesson, students are often encouraged to discuss with a partner their ideas about their writing or the lesson target of the day. Often, students work collaboratively with writing partners to help one another develop a text or to analyze and revise a collaborative text. Students develop their oral and written communication skills while thinking critically about the craft and structure of writing.
- **IMS Schoology:** Islander is in its third year of utilizing Schoology as an interface between the classroom and home. Schoology is similar to Facebook in its layout, usability, and two-way communication and collaboration opportunities. It is different than Facebook in that it is a closed community. Teachers post assignments, upload documents, use it for on-line discussions and

assessments. Students access homework that all downloads onto a calendar. This allows them to go to one place and see all of their work from all of their classes. We have been thrilled with the way students use Schoology for communication and collaboration. When they have a question they can post it to a classroom wall and both the students and the teacher can respond and dialogue about that question. Students can use it to work together from home. Our teachers have also found incredible ways to connect Schoology with the 1-to-1 iPad implementation. Students download work from Schoology and also dropbox assignments back to Schoology both within the classroom and from home.

- **High School Special Interest Group Project** - Students in Alexandra Kattar's AP Comparative Government class completed a group project that required them to form a special interest group with their peers. The purpose of the project was to create an informative and persuasive website. The intended audience of the websites were residents of Mercer Island ages 14 to 20. The requirements of the website were that it must provide information about each group's selected policy position that would allow those who visited the site to learn about the issue, representatives and organizations that support or oppose the policy position, and what they can do if they want to get more involved in this issue. The project also asked students to contribute to the democratic process by encouraging participation from their community. By creating a special interest group and their websites, students learned about the how government works and about the role of the citizen in representative democracy.

#### Theme 4: Information and Technology Literacy in Curriculum Design

- **K-12 Digital Citizenship:** In response to Best Practices and Federal Mandates the Mercer Island School District provides direct instruction annually for all students K-12 on Digital Citizenship. At the elementary level, topics range from safe websites and simple passwords for young students to protection of personal information, online safety and an introduction to cyberbullying for older students. In 8<sup>th</sup> through 12<sup>th</sup> grades these concepts grow in complexity and depth covering social media, etiquette, digital footprint and online presence as well as advanced search techniques and critical thinking for online research. In addition to succinct direct instruction these topics are often imbedded in classroom discussion integrated into the curriculum and student projects.
- **5<sup>th</sup> Grade 1-1 iPad Pilot:** During the 2013-2014 school year three 5<sup>th</sup> grade classrooms participated in a 1:1 iPad pilot. With a dedicated iPad for each student, teachers were able to engage their classes on a new level. Particularly powerful was the ability for students to have instant timely access to online research as opposed to previous experience with shared laptops. In addition, apps such as PicCollage, ShowMe, iMovie, DoodleBuddy, Notability, Keynote and Pages empowered students to synthesize their ideas and showcase their understanding.
- **IMS Flipped Classrooms:** IMS is exploring the concept of a flipped classroom model as an instructional strategy that utilizes technology to advance student learning. In this model, student homework is to watch teacher-created videos of direct instruction about a specific topic. Students can watch the video at their own pace and multiple times depending on their individual learning needs. After watching the video at home, students do their traditional homework during class. This blended model provides students the opportunity to have more personalized learning opportunities and direct access to the teacher as they are completing their independent practice. This approach has been primarily used in mathematics courses but IMS is exploring its application in other content areas.
- **8<sup>th</sup> – 12<sup>th</sup> Grade 1-1 iPad Program:** With a focus on personalized learning from the MISD 20/20 vision, the 1:1 iPad initiative was implemented in grades 8th-12th. Placing an iPad in the hands of each student challenged students and teachers alike to adjust to a new learning experience. For students, the iPad not only provided them an organizational tool, but it also opened up new opportunities for higher level thinking, communication, and an array of ways to show their understanding of the skills and content they were learning. Teachers in 8th-12th grade benefited from the accessibility of information

and the formative data they gathered from the students to help them better adhere to the needs of their students. From Notability, Pic Collage, Socrative, Educreations, to creating iMovie projects with green screen features, the students and teachers used the iPads to enhance their learning.

- **High School Spanish Use of iPads to Enhance Curriculum, Instruction, and Assessment -** Spanish teacher Peggy Aguilar has incorporated the use of iPads into her day-to-day interactions, expectations, and assessments for students. One of the primary uses and benefits of the 1:1 initiative that supports students learning a new language is their ability to access authentic materials in Spanish (listening to native Spanish speakers, news broadcasts, reading articles, interpreting graphs, etc.) so that they have exposure to different regional accents, authentic forms of communication in the language, etc. Additionally, Aguilar uses the iPads to gather real-time data that she uses immediately to inform and modify instruction to meet the needs of her students. Aguilar also feels that iPads allow for flexible differentiation by letting students work at their own pace (e.g. when listening to native speaker videos each student can listen, rewind, re-listen as many times as the individually need). Aguilar also provides for her students via the iPads resources for students to study online by unit on her website; students choose what they need practice with and can work in class or at home at their own pace.

#### RECOMMENDATION:

The superintendent recommends the board achieve a strong majority or unanimous decision on the monitoring of Fundamental 5. To that end, he further recommends that should additional data / indicators be requested, that such additional information receive a majority vote of the board with the expectation that the board show its support to the schools for the work they are doing around Vision 2020 and its accompanying fundamentals.