



Competency Based Education:

Program Overview and Framework

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Abstract

American Academy of Innovation (AAI) implements the following competency-based education (CBE) plan as both a continuation and substantial improvement of its preceding model. The previous education program centered on experiential learning (EL) and project-based learning (PBL). The updated model centers on planning, developing, implementing, and assessing of academic, experiential, and project-based curriculum. The plan maintains a competency framework for progression within core subjects, allowing for multiple progression rates while meeting state-specified mandates of reporting and efficacy.

Key Terms

- **Artifact Designation:** modules, projects, or tasks eligible for student portfolios.
- **Building Blocks:** the optimal order of sequential levels or steps in which students should master a standard in order to reach desired outcomes.
- **Competencies:** larger defined categories which are explicit, measurable, transferable learning objectives comprised of standards.
- **Courses:** curriculum and content which constitutes one credit.
- **Cross-curricular/Interdisciplinary Modules:** units of learning comprised of standards from multiple disciplines. Teachers work in tandem to assess standards.
- **Learning Progression:** a coherent, continuous pathway along which students move incrementally through stages of increasing competence.
- **Lower Anchor:** foundational skills and knowledge a learner should possess before progressing deeper into the content.
- **Mentor:** a teacher designated to mentor a student through the school experience for the year.

- Pathway: a way of achieving a specified result.
- Quarter: eight-week block of time on the school calendar.
- Quarter Credit: awarded at the quarter if proficiency is met at a level 2 or higher on all standards.
- Specialization: an area of concentration in which a learner concentrates or pursues distinguished competency.
- Standards: concise, written descriptions of what students are expected to know and demonstrate at a specific stage of their education.
- Upper Anchor: Grade-level standard represented by higher-order skills.
- Workshops: multi-grade, experiential courses held on Fridays, wherein students may: earn course credit, accelerate their pathway to graduation, work in courses where additional time is needed, explore core content at a deeper level, or experience content in a hands-on manner.

Explicit Learning Progressions, Pathways, Tracks and Specializations

Learning Progressions Process

A learning progression is an ordered sequence of information, data, content, or knowledge whereby learners achieve a standard or significant curricular outcome. Learning progressions include building blocks which students must master in order to reach desired standards or outcomes. This process provides guidance for progression in learning. Concepts within the progression grow in complexity as learners work through the standards. It is important to note learning progressions are not a curriculum plan, or rubric.

Unpacking standard/significant outcome

- Method for instruction
 - Identify standard or outcome.
 - Students need to understand:
 - Student should consider such questions as:
 - In order to effectively consider such questions, students need to:
 - Know- specific knowledge
 - Do-specific tasks
- Sequence of Building Blocks

- Use Webb’s Cognitive Rigor Matrix to develop the sequence of blocks which illustrate how depth of knowledge increases both in terms of the type of thinking required and the depth with which the student must understand the content in order to successfully interact with it.

Guidance for how to develop a learning progression for the grade level

To maximize achievement of learning progressions, educators refer to the following table when designing curricula. Levels are expanded or contracted as dictated by the desired outcome.

Table 1. Learning progression template

Level	Students will be able to:	Potential Misconception:	Students need to learn:
1	Lower Anchor		Least Sophisticated
2	Building Block 1		Increase
3	Building Block 2		Increase
4	Building Block 3		Increase
5	Upper Anchor		Most Sophisticated

Level	Students will be able to	Potential Misconception (errors)	What students need to learn
1	Student may not recognize the earth is spherical.	Darkness occurs due to clouds, atmosphere, cover the sun. Sun goes below the earth at night.	The sun appears to move across the sky every day.
2	Recognize the sun appears to move across the sky every day.	Sun travels around earth. Earth is center of the universe.	The earth orbits the sun. The moon orbits earth.
3	Know that the earth orbits the sun, the moon orbits the earth, and the earth rotates on its axis.	It gets dark at night because the earth goes around the sun once a day	Earth orbit and rotation Orbital duration. Rotation duration-day/night cycle. Moon orbit/phases/cycle
4	Coordinate apparent and actual motion of objects in the sky: earth is both orbiting the sun and rotating on axis, orbital duration- once per year, rotation duration- day/night cycle, moon orbits the earth- moon phases 28-day cycle	Seasons are caused by the changing distance between the earth and the sun: the phases of the moon are caused by a shadow of other planets, the sun, or the earth falling on the moon	Day/night cycle, phases of the moon, season
5	Describe the motions of the earth and moon within the solar system, including the day/night cycles, phases of the moon, and seasons.	N/A	N/A

Table 2. How it all fits together (Example from Journal of Research in Science Teaching Vol. 46, Wilson, Mark. 2009)

Pathway Designation

Pathways include seminars, project-based learning, and self-paced learning. These pathways are aligned to state requirements for grade progression and graduation. Upon completion, new pathways become available. While some pathways are self-explanatory, such as completing Drawing I prior to Drawing II, others are less evident. Students should meet prerequisites, as listed in the course catalog, prior to taking a specific course, including concurrent enrollment courses.

Specializations

Upon completion of their sophomore year, learners may declare a path of specialization with an emphasis on a specific subject, skillset, or personal interest. Students who demonstrate achievement in at least one specialization are awarded the corresponding graduation cord.

Specializations include but are not limited to CTE, Science, Health & Athletics, Performing Arts, Visual Arts, Animal Science, Language Arts, History, and Computer Programming. Students are required to make an oral declaration of their specialization prior to the start of their junior year.

AAI Competencies

The AAI competency framework is designed to prepare twenty-first century students for a global society. Competencies give an overall, supplemental picture of a learner's strengths and interests. Competencies are utilized as a starting point to guide students in exploration of secondary and post-secondary options, but not used to restrict student choice.

Competencies are categorized into the following: applied science and technology, inquiry research and design, communication and expression, math reasoning and modeling, civic and global learning, and self-development and social intelligence. Currently, the division of standards into the competencies follows the organization structure found on the UEN website for courses. It is the intention of AAI to realign the competencies by having content teachers divide discipline specific standards into the competency structure by the 2020–2021 school year.

COMPETENCY BASED EDUCATION THREE YEAR PLAN

Applied Science and Technology	Inquiry and Research Design	Communication and Expression
Agricultural Sciences	Agricultural Sciences	ELA
Biology	Biology	Foreign Language
Chemistry	Capstone Projects	Gaming/web design
Earth Science	Chemistry	Government
Engineering	Earth Science	History
Physics	Engineering	PE/Yoga
Robotics	Government	Visual/performing arts
	Health	
	History	
	I ²	
	PE/Yoga	
	Physics	
	Programming/game development	
	Robotics	
	Visual/performing arts	
	ELA	
Math Reasoning and Modeling	Civic and Global Learning	Self-Development and Social Intelligence
Calculus	Agricultural Sciences	Agricultural Science
Computer Science	Earth Science	Capstone projects
Chemistry	ELA	ELA
Engineering	Foreign Language	FACS
Financial Literacy	Geography	Foreign Language
Physics	Government	Government
Robotics	History	Health
Secondary Math I	Visual/performing arts	History
Secondary Math II		I ²
Secondary Math III		PE
		Visual/performing arts
		Yoga

FIGURE 1. Division of courses into AAI Competency categories.

Levels of Knowledge

Levels of knowledge comprise learning schemata for students. As learners accumulate a cognitive foundation of facts and formulas, knowledge is increased while incorporating new layers of breadth and depth.

Progression through the levels is critical for learners to move from the acquisition of knowledge to the practical application of twenty-first century skills at the highest level possible.

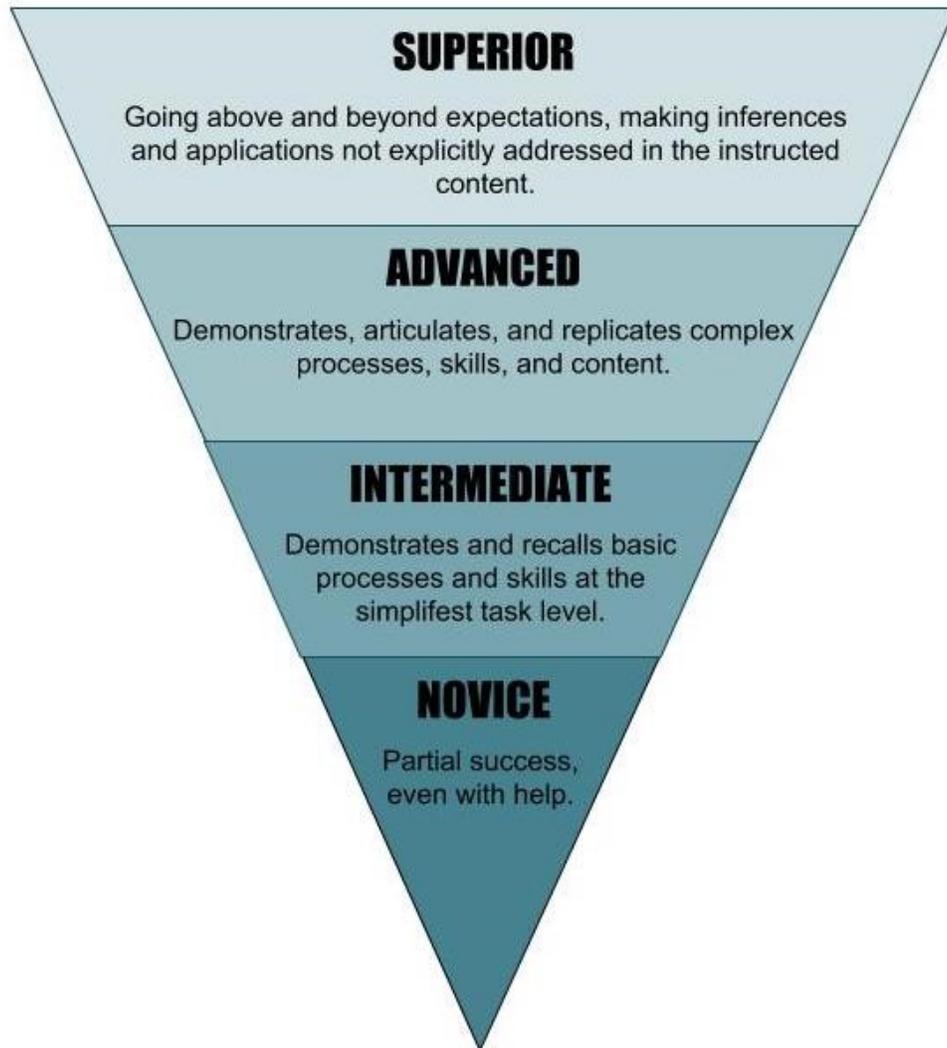
Proficiency Scale

A proficiency scale is developed to gauge the various levels of knowledge and abilities as learners progress through the competencies. AAI has adopted the proficiency scale as set forth by the American Council on the Teaching of Foreign Language (ACTFL).

As learning tasks and modules are assessed, student performance is graded according to the following proficiency scale:

- 4.0 - Superior Performance
- 3.0 - Advanced Performance
- 2.0 - Intermediate Performance
- 1.0 - Novice Performance
- I - Insufficient Evidence

FIGURE 2. These four levels of proficiency are delineated according to a hierarchy of global tasks.



In order to progress in a course, a learner must demonstrate proficiency at a level 2 or higher at the quarter mark. The transcript lists a course as NG-No Grade, until the learner has demonstrated such proficiency.

Cognitive Rigor (Breadth and Depth of Knowledge)

Karin Hess’s Cognitive Rigor Matrix (CRM) is the application of Webb’s Depth-of-Knowledge Levels to Bloom’s Cognitive Process Dimensions. AAI adopts this CRM model as a practical approach for developing rigor and learning progressions across the disciplines. The CRM also provides a platform by which learners may provide evidence and demonstrate proficiency through the competencies.

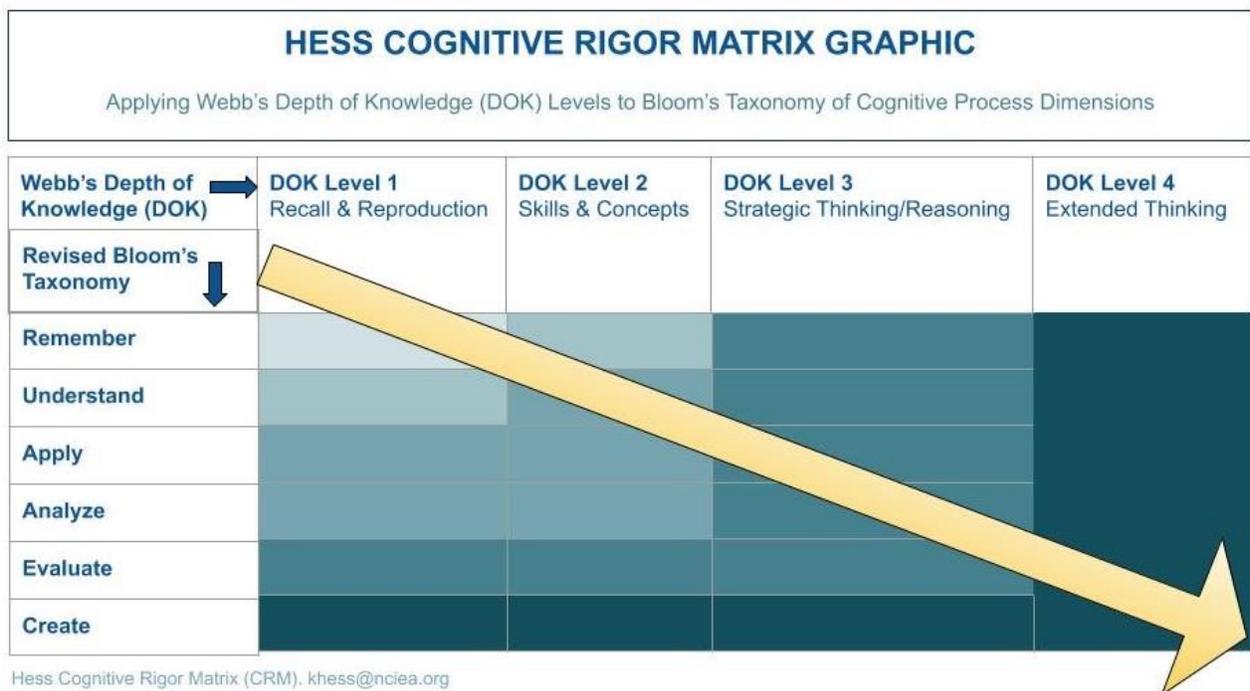


FIGURE 3. Applying Webb’s DOK to Bloom’s Cognitive Process Dimensions

Reporting, Tracking, and LMS Integration

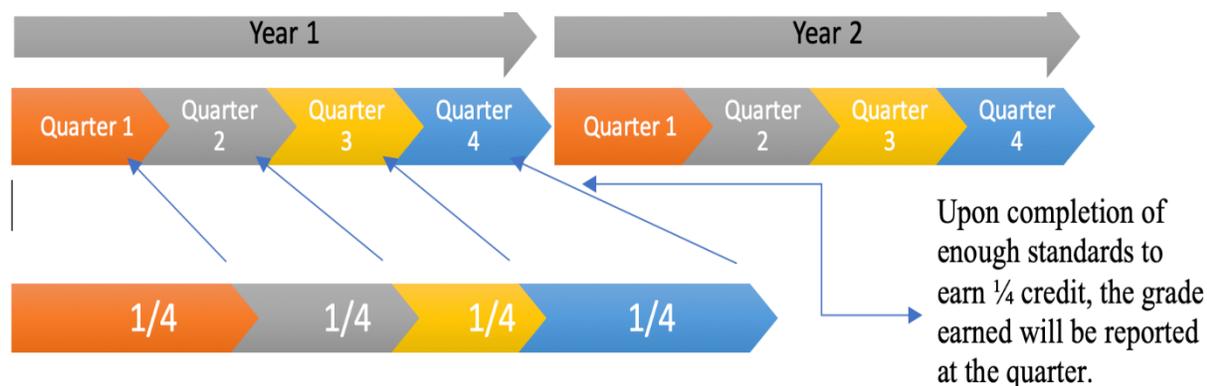
Assessing Student Work

Assessment takes place when evidence for each task has been viewed, evaluated, and assigned a score on the AAI Proficiency Scale by the content teacher. The list of learning targets (standards) appears in the LMS.

Reporting Methods & Timeframes

Completion of a quarter credit means twenty-five percent of the aligned standards for one-credit courses, or fifty percent of the aligned standards for half-credit courses, meets a minimum proficiency of two. Proficiencies translate to a standard letter grade (A, B, C) upon completion of a quarter credit. The method for grade translation follows a basic rounding calculation. Teachers use a simple average of proficiency scores from the aligned standards. Once the simple average is calculated, the teacher rounds the score to the nearest whole number and assigns the letter grade: 2=C, 3=B, 4=A. Standard letter grades are reported to the state through Aspire at the end of each quarter. A designation of "no grade" is reported in Aspire for incomplete quarter credit. Once a student finishes enough work to reach a quarter credit, the earned grade is updated and reported in Aspire for the corresponding quarter. See diagram below.

Figure 4. Typical grade reporting and credit awarding timeline.

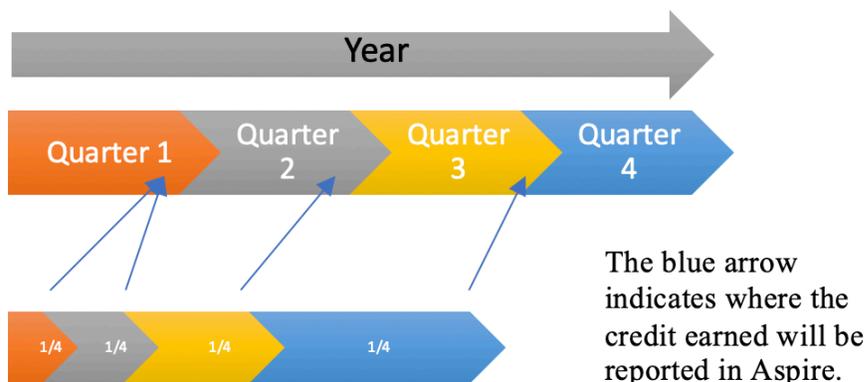


Thus, students have flexibility to work ahead or at a slower pace than the eight-week quarter timeframe. Students working at a slower pace may do so, however at the end of the quarter a designation of “no grade” is reported. Once the quarter credit is earned, the grade is retroactively reported.

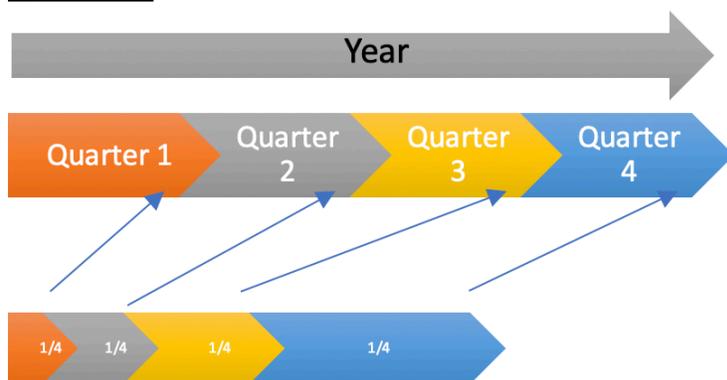
Students who complete coursework ahead of the expected timeframe may have their grade averaged into a single quarter. For example, if a student finishes two quarters worth of credit, that grade could be reported in a single quarter. As shown in Figure 5, there are two options for accelerated grade reporting. Option 1 is likely to be used for students moving more rapidly through material, when transcript reporting is crucial for early graduation. Option 2 follows a similar pattern, with the major difference being the delayed reporting of the second quarter credit.

Figure 5. Atypical grade reporting and credit awarding timeline

Option 1:



Option 2:



LMS Integration

It is inevitable that teachers want and need to customize their usage of the LMS. However, for the sake of consistency and clarity of understanding we would like this to be limited. The framework outlined in the training videos should be used for all courses, excluding Friday workshops and Innovative immersions (I²). Reporting for these courses are managed by counselors.

AAI has partnered with Empower to offer a robust Competency Based Education Learning Management System to all stakeholders. Teachers will build courses in Empower and align said courses to the Utah Core Standards. Individual activities will be aligned with standards and identified as evidence for the aligned standards.

Competency Grading Policy

Course Placement

Diagnostic data derived from academic records, including AAI assessments, are used to place learners in appropriate courses, and to modify a course schedule as needed.

Assessment

Evidence of learning includes practice, projects, exams, and mastery of standards. Rubrics, standards, and assessment requirements are published at the beginning of each assignment. Additional assessments include benchmark testing as well as standardized tests, as mandated by the state.

Alternative & Cross-Curricular Assignments

Learners wishing to complete alternative assignments for course credit will:

- submit a written proposal of the assignment to the content teacher(s)
- create and attach a standards-based rubric
- receive approval from the content teacher(s) before beginning the work

Innovative immersions (I²) & workshops

Students may submit work completed/created for I², workshops, and cross-curricular projects for regular course credit. The regular course teacher may:

- accept the work using the assessment given by the I² or workshop instructor
- accept the work, but reassess it themselves
- not permit the work to be submitted for course credit

Teachers may request revisions to rubrics or projects prior to awarding credit.

Key Reporting Dates

Student progress is assessed at the end of each quarter. Students achieving a level 2 proficiency or higher may advance from the course at this time. Learners not meeting this benchmark may continue in the course until such benchmark is reached, prior to graduation. Teachers update the LMS regularly, providing continuous data of progress and pacing. Course credit is recorded and reported to the state quarterly.

Mentors

Mentors are crucial to the CBE model. Mentors communicate with students, parents, teachers, and counselors frequently, providing academic tracking and progress. This collaborative effort improves academic performance and helps each party to gain a clear understanding of requirements for advancement. Mentors offer additional guidance with course work, presentations, academic portfolios, and grade-level projects.

Training Plan

In order to articulate, organize, and train the various stakeholders it is necessary to compile all the necessary information into a comprehensive white paper and then develop several training modules to address the various audiences. Thus, herein is outlined the training framework and plan. The details are filled in utilizing the various applicable sections of this document.

➤ Teachers and Staff

- Terminology overview and definitions
- Philosophy of AAI
- Philosophy of pedagogy
 - Pedagogical training outline:
 - https://aaiutah-my.sharepoint.com/:w:/g/personal/emma_steuart_aaiutah_org/EUHIP55g3SVCuN0Q32efyucBwIIDBCg2z2TdlN8KqU4kzA?e=xUNXvb
- Mentor Training (Key Program)
 - Mentor training program: <https://www.ncjrs.gov/pdffiles1/ojjdp/grants/244759.pdf>

- Mentor role and responsibilities: https://aaiutah-my.sharepoint.com/:w:/g/personal/ryan_hagge_aaiutah_org/ERxDS1P17vVJiOOBmKNuKTsBPMoik0ws6HLmNfycvNIyhA?e=WUPN87
- CHOICE (Key Program)
 - Framework: CHOICE Brochure: https://aaiutah-my.sharepoint.com/:w:/g/personal/russell_cowley_aaiutah_org/Ecej4EBse8hJnAUZGLt_tJQBLNQm2Fna8IqokCxEE2YGgg?e=3YyWVG
 - Curriculum Map: https://aaiutah-my.sharepoint.com/:w:/g/personal/ryan_hagge_aaiutah_org/EbBqSeWIR75GqBVtFV0FKSYBAyfwv02EJZ6nFUBr6kDUBw?e=MMBCUF
- Project Based Learning and Experiential Education (Key Program)
 - Summer reading and teacher training: https://aaiutah-my.sharepoint.com/:w:/g/personal/chellee_rice_aaiutah_org/

[Eb_mmkgpgN9hOqrKNkT5aEGsB1QA7f-EUZyQjfpAhanK03g?
e=MBVvwB](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=MBVvwB)

- Schoolwide Academic Preparedness and Integrity

- Staff instructions for course disclosure form: [https://](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=0nasYw)

[aaiutah-my.sharepoint.com/:w:/g/personal/](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=0nasYw)

[austin_wrathall_aaiutah_org/](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=0nasYw)

[ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=0nasYw)

[e=0nasYw](https://aaiutah-my.sharepoint.com/:w:/g/personal/austin_wrathall_aaiutah_org/ET-86vN5xPBPqqUbFYeimwIBTVNqEYNdG-77BJNoeo3heA?e=0nasYw)

- Course disclosure form (editable in browser): [https://](https://aaiutah-my.sharepoint.com/:b:/g/personal/austin_wrathall_aaiutah_org/EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?e=conPU0)

[aaiutah-my.sharepoint.com/:b:/g/personal/](https://aaiutah-my.sharepoint.com/:b:/g/personal/austin_wrathall_aaiutah_org/EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?e=conPU0)

[austin_wrathall_aaiutah_org/](https://aaiutah-my.sharepoint.com/:b:/g/personal/austin_wrathall_aaiutah_org/EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?e=conPU0)

[EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?](https://aaiutah-my.sharepoint.com/:b:/g/personal/austin_wrathall_aaiutah_org/EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?e=conPU0)

[e=conPU0](https://aaiutah-my.sharepoint.com/:b:/g/personal/austin_wrathall_aaiutah_org/EWoczJ4GpshKg24Q_x60sCMBsVrSoCajRkm6xhg5tXb89w?e=conPU0)

- Competency Based Education

- Overview document: [https://www.competencyworks.org/](https://www.competencyworks.org/wp-content/uploads/2018/10/Quality-Principles-Book.pdf)

[wp-content/uploads/2018/10/Quality-Principles-Book.pdf](https://www.competencyworks.org/wp-content/uploads/2018/10/Quality-Principles-Book.pdf)

- Best practices document: [http://soltreemrls3.s3-website-](http://soltreemrls3.s3-website-us-west-2.amazonaws.com/marzanoresearch.com/media/documents/Personalized_CBE_Whitepaper_September_2016.pdf)

[us-west-2.amazonaws.com/marzanoresearch.com/media/](http://soltreemrls3.s3-website-us-west-2.amazonaws.com/marzanoresearch.com/media/documents/Personalized_CBE_Whitepaper_September_2016.pdf)

[documents/](http://soltreemrls3.s3-website-us-west-2.amazonaws.com/marzanoresearch.com/media/documents/Personalized_CBE_Whitepaper_September_2016.pdf)

[Personalized_CBE_Whitepaper_September_2016.pdf](http://soltreemrls3.s3-website-us-west-2.amazonaws.com/marzanoresearch.com/media/documents/Personalized_CBE_Whitepaper_September_2016.pdf)

- Higher Ed. Legislation (found under Legislative action):
<https://higheredutah.org/overview-2019-legislative-session-outcomes/>
- Case study: <https://www.competencyworks.org/categories/case-study/>
- AAI Competencies:
 - Example of how competencies might be displayed https://aaiutah-my.sharepoint.com/:x:/g/personal/marilyn_ard_aaiutah_org/EdNz2wnR8cRPgZF4X5Gc2L4Bl_CYjDvkgQbobiE6HR3NUw?e=JhF3We
 - Competencies and what subjects align with them https://aaiutah-my.sharepoint.com/:x:/g/personal/marilyn_ard_aaiutah_org/EVXKbXKzKKJHgmu9Mtc0nXsBuGL_cv83jrQWGvh0P6fqOg?e=3LUqyf
- Specializations
 - Student declared specialization overview: <https://aaiutah-my.sharepoint.com/:w:/g/personal/>

sean_mckelvie_aaiutah_org/ES71LBNSFNpAtTe4-T_IVDEBOzmvD9bUgHRcEo1DwBXMOW?e=WJCiwu

- LMS (mostly screencasts)
 - Navigation, Creation guidelines, Mechanics and features, Grading and reporting
 - Training Link: https://aaiutah-my.sharepoint.com/:w:/g/personal/ryan_hagge_aaiutah_org/EfmLGfIs3qdOuNdkHLVR_VEBG1KgZxpePd_seoAuwlIVew?e=SgZz5A

- Aspire
 - Attendance: <https://drive.google.com/file/d/1GU2UAFkckY7RSRhFo9CvfdF5s2SpV00i/view>
 - Quarterly grade reports: https://drive.google.com/file/d/1AYRU7mvf8nybUa9m2_w-QfnEhCT6fjzK/view
 - Credits: Counselors responsible for organizing and verifying student credit.

➤ Parents and Guardians

- LMS
 - Navigation

- Usage guidelines
- Mechanics and features
- Grading and reporting
- Mentor training for parents: https://aaiutah-my.sharepoint.com/:w:/g/personal/ryan_hagge_aaiutah_org/ERxDS1P17vVJiOOBmKnuKTsBPMoik0ws6HLmNfycvNIyhA?e=WUPN87
- Grade level projects and portfolios - https://aaiutah-my.sharepoint.com/:w:/g/personal/emma_steuart_aaiutah_org/EZrUIImaNmdDj6SX28bDjscB9RslBd1IbqBtFPK8dEEhdw?e=ZvzMyt

➤ Students

- LMS
 - Navigation
 - Usage guidelines
 - Mechanics and features
 - Grading and reporting

- Mentor training for students: https://aaiutah-my.sharepoint.com/:b:/g/personal/ryan_hagge_aaiutah_org/ERKmQ4lL2g1Hi7T8W8cCkFMBXaGqVXq2QYrzCk30fFmoQg?e=hmngI
- Grade level projects and portfolios - https://aaiutah-my.sharepoint.com/:w:/g/personal/emma_steuart_aaiutah_org/EZrUIImaNmdDj6SX28bDjscB9RslBd1IbqBtFPK8dEEhdw?e=ZvzMyt