

Davis Joint Unified School District

Career Technical Education / Science Technology Engineering Agriculture-
Arts Mathematics Committee
(CTE/STEAM² Team)

Report on Committee Recommendations
March 17, 2016

Updated October 12, 2016

Executive Summary

In July 2015, Superintendent Roberson invited employees of DJUSD and members of the community to come together as an advisory committee focused on Career Technical Education (CTE) and Science, Technology, Engineering and Mathematics (STEM) curriculum. In his invitation to members, he advanced the district's commitment to these curricular areas.

The CTE/STEM Advisory was established as an ad-hoc group with a particular focus and a tight timeline. Members met over a five-month period on the first and third Tuesday of each month with the charge to identify academic pathways, create capstone courses and develop recommendations for STEM integration.

At the first meeting, members were asked to identify others in our local area that should be included in the group. Several individuals were identified, invited, and joined the group. Additionally, in the early meetings, the group agreed to expand STEM to STEAM² in recognition of the importance of agriculture and arts in our area.

The intentional work of the CTE/STEAM² Advisory led to specific recommendations that will guide the work of the district and promote ongoing investment in CTE/STEAM² education. Additionally, with the grounding of this work in a collaborative team that represents the district and community partners, on-going collaboration is already taking place. Further, these recommendations are being used to help identify priorities for several grants currently supporting DJUSD students and programs.

Our students, district, and community will benefit from the dedication, work and commitment of the individuals of this group.

Introduction

Davis Joint Unified School District holds ongoing efforts to advance academic excellence throughout its curricular offerings. DJUSD understands the need for students to develop sophisticated technical, academic, critical thinking, and problem solving skill sets that will allow them to flourish in post-secondary endeavors and future careers.

Davis Joint Unified School District is committed to Career Technical Education (CTE) and Science Technology Engineering & Mathematics (STEM) preparation as can be noted by the variety and scope of curricula that is offered. In its efforts to expand, enhance, and improve CTE/STEM offerings, Superintendent Roberson directed special attention toward six specific objectives for the 2015-2016 school year:

- Qualify Davis Senior HS as a national STEM school
- Integrate STEA²M thinking in to the school curriculum
- Increase student interest and participation in CTE/STEA²M courses
- Design, develop and expand CTE/STEA²M pathways and offerings at DHS and in the district
- Build a CTE/STEA²M community support network for students and teachers
- Seek CTE/STEA²M related internship opportunities for students

CTE/STEA²M Advisory Team

To assist in the efforts, the Superintendent called for a committee to convene for the specific purpose of developing recommendations on how we may best achieve stated objectives. In July of 2015, a call went out and invitations were sent to stakeholders and individuals with specific expertise in developing, implementing and supporting CTE/STEM programs. The Superintendent gathered a talented team of Davis teachers, parents, students, UC Davis and community college partners, STEM related business professionals, and other industry leaders.

The talented group met for the first time on August 18, 2015 and formed our DJUSD CTE/STEA²M Advisory Team. A list of committee members is included in the appendix of this document. During the first few sessions, members were asked which additional stakeholders could be invited to benefit the work of the group. Additional invitations were transmitted and attendance grew helping assure a broad range of stakeholder perspectives were included and that all areas of expertise desired were represented.

Work of the Committee

Each member was asked to make a commitment of time and contribute to the success of the committee by developing sound recommendations on the six stated objectives and develop recommendations the Superintendent could take to the Board for consideration. The Advisory Team met in the meeting rooms of Davis Joint Unified School District on the 1st and 3rd Tuesday of each month between August of 2015 and December 2015. From start to finish, the

sessions progressed naturally through working phases that can be called Learning, Collaborating, and Recommending.

Learning Phase

During the *Learning Phase*, committee members provided ideas and insight from their personal perspectives and backgrounds. Background and technical information was presented and provided. Brainstorming sessions occurred. Questions were asked and answers provided. The District provided the committee (and the community) a website to provide an array of resources. Additionally, the website housed meeting agendas and information stemming from committee meetings. Committee members, and the broader community, could access the work of the committee through the District Website Homepage by looking at Hot Topics in the Quick link section.

Collaborating Phase

While the committee was collaborative in nature, the *Collaborating Phase* is where the committee split into working subgroups. Working subgroups then established team norms they felt appropriate to advance their efforts. Each working subgroup focused on a specific objective for the purpose of developing recommendations that may be considered by the Board. Writing prompts were provided to guide the development of committee recommendations in three specific areas; 1) Advice, 2) Assistance, and 3) Advocacy. The prompts were not restrictive and presented only as a way to categorize working group ideas and highlight the three areas that, generally, advisory groups were known to have strength. Individual group members could focus on one particular objective and move about freely between working subgroups. Google Docs were used to help document the work of the committee and facilitate access by all members. Every member of the committee held real time access to documents being developed and could participate during committee sessions, between sessions, while they were absent, or as they felt necessary. Documents submitted are included in the appendix of this report.

Recommending Phase

The *Recommending Phase* represents the culminating efforts of the group. During the *Recommending Phase*, working subgroups presented the recommendations they developed to the entire group. Feedback was provided by the larger group in the form of questions, comments, and/or additions. Feedback from the entire committee was used for the purpose of refining initial subgroup recommendations. After reflection and refinement, each working subgroup presented a final set of recommendations. Draft documents shared and developed by the committee are included in the appendix of this report.

DJUSD CTE/STEA²M Advisory Team Recommendations

Objective # 1 Recommendation for qualifying DSHS as a National STEM School

During the learning phase, several questions were raised about the application, the process, its value, and what a private party certification could mean for DSHS and its programs. Additionally, the group could see that supporting STEM certification items like 1) clearly articulated sequence of courses within defined pathways, 2) industry alignment, 3) formalized external partnerships, and 4) assessing programmatic needs, would help assure quality programs and efforts locally.

The committee recommendation for objective number one is for the DJUSD to pursue the effort to certify through the application process and for additional members of the committee or stakeholder group assist in the effort.

Action: The application for has been submitted to the National Consortium for Secondary STEM Schools. Earlier this month, we were notified that our application has been accepted and we are members of the Consortium. This membership should position us better for future grant applications.

Update: Davis Senior High School has been certified as a National STEM School and is currently an Associate Member of the National Consortium of Secondary STEM School (NCSSS Associate). The [National Consortium of Secondary STEM Schools \(NCSSS\)](#) was established in 1988 to provide a forum for specialized secondary schools focused on science, technology, engineering, and mathematics (STEM) disciplines to exchange information and program ideas. As a member of this consortium, DSHS is able to network with other schools in the country to continue to build our program.

Objective # 2 Recommendation for integrating STEA²M thinking across the school curriculum

Clearly, professional development in CTE, Curricular Integration, and STEA²M was called for by the group. Interdisciplinary teaching teams, and focal programs. The need to develop groupings of time, space, and people was evident. Early entry and access to programs by students was offered out to the group for consideration.

Recommendations for this objective included:

- The committee recommends that emphasis and support is placed in program areas where STEA²M thinking is currently embedded, especially in courses that focus on putting theory into practice by creating products or solutions needed in society.

- The Board should consider providing additional resources and support for courses that are connected with industry, that integrate science and technology, that promote collaboration, and that lead to some type of certification.
 - A specific example of such support could be class size of 24 students for lab / application based classes.

Update: Elementary science and technology programs are a focus of the District Technology Advisory Committee. NGSS teams have collaborated throughout the year to develop elementary through secondary lessons. Existing CTE/STEAM² pathways have conducted Self Assessments of program quality. The high schools and junior high schools have planned to meet this school year in concentration areas for increased articulation and greater collaboration.

Objective # 3 Recommendation for increasing student interest and participation in CTE/STEAM² courses

It was evident early on that the group was fairly vocal in presenting ideas for increasing interest and participation in CTE/STEAM² courses. Recruitment and outreach, starting as early as 5th grade and continuing throughout each of the grade spans, was an integral piece of the plan posed by the committee. Aligning courses to have formalized career and college connections such as industry certification and articulated pathways to community college, California State University, and University of California programs was also clearly evident. Requiring CTE/STEAM² content and exposure to various field experiences early to assist and developing college and career readiness was expressed in abundance. As abundant, if not more so, was discussion on the need for CTE/STEAM² courses to be student driven, collaborative in nature, project based, peer to peer oriented and activity focused. Publicity (student to student, brochures and flyers, and parent marketing campaigns) was noted as well.

Priority Recommendations:

1. Support for the CTE coordinator
2. Development of PTA/PTO Community supported Career Days at all junior high schools;
3. Continue to expand the Electives Road Show.

Recommendations for this objective included:

- Assess current course designations to determine if A-G, formal articulations, or certifications best suit the needs of the students, the course, the sequence, and the programming.
- Maintain and enhance programmatic pathways (sequence of courses) that lead to industry certifications (e.g. network certification).
- Use counselors and staff resources to make formal contact with students for the purpose of encouraging non-traditional (non-trad) students to enroll in CTE courses (focused on Jr. High and HS students). Non-trads are any under-represented population by area.

- Provide incentives or resources that develop program identities or brands connected to student interests. Foster the development of student groups and youth-run organizations/communities unique to the program area and that are integral in nature.
- Develop 5th/6th grade student and teacher appropriate materials that educate elementary students, their families, and their teachers about CTE/STEA²M opportunities beyond school as well as programs offered at our middle schools and high schools that help students and parents explore and prepare.
- Offer a range of CTE classes at the Junior High level to stimulate student interest and provide opportunities to explore a variety of CTE areas. Assure offering at each Junior High are substantially similar to those provided at other sites and articulate with the high schools.
- Develop exploratory course offerings for 8th grade developed where students are introduced to a program of study each quarter that relates to CTE courses they haven't been exposed to otherwise and connect with programmatic offerings at the high school.
- Develop PTA/PTO Community supported Career Days at all junior highs in the district that include a variety of speakers and, at a minimum, represent high-demand or high-wage and high skilled careers aligned with high school CTE programs.
- Continue and expand the Electives Road Show to share 11th & 12 grade CTE projects and class highlights with 9th graders at each junior high, and for the 10th graders at DHS & DVCA.
- Develop high quality professional promotional videos to promote our CTE courses. Explore the possibility of them being student made. Distribute widely and make available to students and parents through school & district websites.
- Provide adequate support and resources by directing additional FTE currently allotted to the district coordinator position for the specific purpose of coordinating CTE/STEA²M activities and recommendations (above the .2 FTE currently allotted).

The committee was supportive of partnerships to assure curricular integrity and provide all students with alternative ways and opportunities to experience academic success. The committee viewed STEA²M driven Career Technical Education represented a practical option for Davis students to develop college and career readiness for students choosing to embark on careers immediately after high school, enter college certification programs, or pursue professional degrees after graduating high school.

Update: The following bullet points address work that has continued or started in this area

- Instructors of CTE courses and industry sector pathways have completed self-assessments in relation to either program quality or curriculum content standards.
- During Secondary Articulation and Davis High School's Curriculum & Instruction Committee meetings, textbook adoptions and new course proposals have been presented. An intermediate robotics course has been proposed for robotics and a serv-safe text for culinary arts has been recommended. Instructional materials have also been approved by the Curriculum and Instruction Committee at Davis Senior High School.

- The initial Davis Senior High School CTE Department Meeting opened with encouraging all programs to address the needs of any under-represented population.
- Career and Technical Student Organizations (CTSO's) continue to develop and grow. Future Farmers of America, for example, has developed a program of activities and have conduct outreach in the community.
- The district continues to offer a variety of CTE courses across the junior high schools
- Exploratory courses are being offered to 8th graders. Work has started to better connect/align programs of study at the 7th, 8th, and 9th grade level with advanced study/programming options at the high school level (articulation).
- The Electives Road Show was successful and it is planned for the 2016-2017 school year.
- A temporary twenty-percent CTE Coordination position has been filled for the 2016-2017 school year.

Objective # 4 Recommendations for Designing, Developing, Expanding CTE/STEA²M Pathways and Offerings at Davis Senior High School

Having a clearly defined goal and definition of CTE/STEA²M programming for the District was something committee members felt was a basic element needed in developing and expanding pathways and offerings. Additionally, the committee noted that any type of shift would impact FTE and FTE related dynamics in master schedule. Beginning with career days, exploratory courses and introductory level courses, appropriately sequenced courses was also of note. Consideration of facilities, master scheduling, and postsecondary articulations were also noted in discussion. Recently, the Board of Education approved the creation of Veterinary Science course. This a-g approved course is already full and is one of the access points to the partnership between DJUSD and UCD Veterinary School.

Priority Recommendations

1. Provide time to articulate programs vertically and horizontally and between junior high schools, high schools, and post-secondary programs;
2. Develop a funding plan to address facility needs of current programs and align to current industry standards
3. Identify, promote, and communicate integrated core courses (physics, math, art) with CTE/STEA²M to contribute to pathway development;
4. Provide industry pathways and course specific professional development to teachers.

Recommendations for this objective included:

- Articulate programs vertically and horizontally at and between Jr. High School, High School, and postsecondary programs
- Expand Project based and hands on approaches in all areas of CTE/ STEA²M via internships, supervised experiences, community based projects, etc.
- Address facility needs of current programming and align to current industry standards.
- Develop a master facilities plan that includes a new CTE/STEA²M Center

- Create a needs assessment/program plan for new programming proposals prior to be vetted prior to implementation
- Identify, promote, and communicate integrated core courses (physics, math, art) with CTE/STEA2M to contribute to pathway development.
- Build curriculum that can address a broad spectrum of students (differentiated instruction)
- Build “pathways” as the paradigm for all secondary students
- Develop structures and resources like longer class periods, double periods, block periods, and pathway block periods) that support teachers *and* students collaboration time.
- Provide focused, specific and clear Career/Pathway exploration units across each of the middle schools and grade levels.
- Provide industry, pathway, and course specific professional development to teachers.
- The School Board should have regular updates as a standard agenda items (minimum of quarterly) from CTSO’s for program/pathways activity reporting (Board Reports by Students)
- Direct DJUSD Public Information Officer to work with local news media to present articles that cover all aspects of our CTE/ STEA2M students and programs.
- Provide a directive to develop efforts that will result in building a regional organization devoted to the philanthropic development of CTE/STEA2M activities.

Updates:

- CTE teachers have scheduled lateral department times for meetings at the junior high schools to address discipline specific vertical and horizontal collaborations.
- Robotics, Agriculture, and Information Technology are working directly with industry partners for upgrades and alignments with industry standards.
- CTE teachers have noted aspects of their programs that lend themselves to universal design such as mixed level/ability teams, advancing at individual pace, collaborative projects and growth based grading where skill and knowledge assessments based on individual attainment.
- Davis Senior High School is working closely with stakeholders on developing a later start schedule that incorporates a “flex” period that offers opportunities to work and collaborate with students.
- The School Board has been receiving updates from the FFA CTSO.
- Staff from Davis Senior High School attended the California STEM Symposium on October 9-11, 2016.

Objective # 5 Recommendations for building a CTE/STEA2M community support network for students and teachers.

Ideas discussed around developing networks of support for students and teachers revolved around developing administrative support and coordination that would allow for postsecondary alignment of programs, increase community partnerships, and branding of programs so that they were easily recognizable and identifiable by students, parents, and the greater community. Tapping existing resources and addressing policy issues could help streamline efforts.

Priority Recommendations

1. Establish a standing CTE/STEAM² Advisory Committee to provide guidance to the district.
2. Provide flex time in CTE/STEAM² teachers' schedules to meet with industry, network, and work on mandatory projects unique to their program areas.

Recommendations for this recommendation include:

- Establish standing CTE/STEAM² Advisory committee to provide guidance to the DJUSD regarding CTE/STEAM² that has the following elements
 - Manageable in size.
 - Appropriate stakeholder representation (i.e. one secondary teacher and industry rep per industry sector, one secondary admin, one district admin, one community business leader, one County Office of Ed, One community College Rep, One UCD Leader)
 - Empower committee (seek funding, develop regional connections, evaluate pathways, etc.)
- Establish a database of community and industry contacts to provide a resource for teachers (to include a database for teacher professional development contacts)
- Provide flex time in CTE/STEAM² teachers' schedule to meet with industry, network, work on mandatory projects unique to their program area.
- Partner with UC Davis or local companies where teachers can come during the summer and have externship for approximating 2 weeks.
- Develop an annual CTE/STEAM² fair or event to showcase student projects and learning with awards or scholarships sponsored by local businesses.
- Using the district's social media account to do a "Where Are They Now" feature: find students who have graduated and showcase how they are using their CTE classes to be successful in their career and/or college.
- Use social media to connect to the community to promote CTE/STEAM².
- Develop a "Career Cafe" or Brown Bag Series where each Jr. High site opens their doors to community to allow students to learn about "real life" CTE/STEAM² careers.
- Institutionalize connections with the University to provide access to summer science programs for at-risk students
- Investigate connections with the community / informal educational organizations to formalize summer/after school science programs for at-risk students
- Establish outcome metrics to assess the effectiveness of outreach efforts

Updates:

- Spring and fall meeting occurred at UCD Vet School to Develop partnerships in Veterinary Medicine

- Discussion about internship opportunity between Yolo County Office of Education and CTSO presentations occurred over the summer about programming with Davis Chamber of Commerce
- Release time has been available for some CTE/STEAM teachers' schedules in order to meet with industry partners and to work on mandatory projects unique to their program area.
- Staff have met with staff from the UCD Department of Veterinary Medicine in an effort to institutionalize connections with the UCD to provide access to summer science programs for at-risk students

Objective #6 Recommendations for seeking CTE/STEAM related internship opportunities for students.

Davis Joint Unified School District has a history of facilitating and engaging students in Internships. In recent years, there has been a renewed focus on internships and how they can be powerful learning experiences for students as well as assist in developing early interest and expertise by students in specific fields of study. The term "internship" can mean many different things. Discussions revolved around the need to address the technical requirements (insurance, laws, pay, scheduling, hours, type, preparation, orientation, evaluation) and sustainability. Community offerings are available and our programs could employ interns for pathway enhancement. Site coordination is lacking at DHS and District Coordination is a must.

Priority Recommendation

That we create a position that is the District liaison to community and industry on internship matters.

Recommendations for this objective included:

- Reflect on what currently exists, what is desired, and how changes may impact current offerings.
- Move purposely to develop the infrastructure to support internship efforts
- Define internships and how they relate curricular goals
- Develop a point person that is the District liaison to community and industry on Internship matters
- Assure compliance is met
- Assure someone in the district monitors compliance

Updates:

- Davis Senior High School Leadership has been asked to discuss interns and internships within their departments to start the conversations, holistically, on Internships for the purpose of bringing together groups of individuals that are interested in looking at

internships more deeply. Department Chairs will report back at DSHS Curriculum and Instruction Committee meetings.

- District staff met with Yolo County Office Education about internships and services they have to offer that can be utilized/customized for our needs.