Valencia College Undergraduate Research Initiative - Work Plan
# Contents

Valencia College Undergraduate Research Initiative - Work Plan ................................................................. 1

Problem/Issue/Statement of Need ........................................................................................................... 3

The Definition of Undergraduate Research ............................................................................................ 4
  Definition of Undergraduate Research ................................................................................................ 5
  Recommended Criteria for Defining Undergraduate Research .............................................................. 5
  Examples of Undergraduate Research in Physics ............................................................................... 7
  Examples of Undergraduate Research in Social Sciences ................................................................. 7
  Examples of Undergraduate Research in Technology-centric Disciplines ....................................... 8

An Undergraduate Research Initiative for Valencia College ................................................................. 9
  Course Embedded Model .................................................................................................................... 9
  Independent Studies Models ........................................................................................................... 11
    Independent Studies: Mentoring .................................................................................................. 11
    Independent Studies: Research Course ..................................................................................... 12
  Research Internships Model .......................................................................................................... 13
  Added Experience for Valencia Transfers to UCF: The Summer Research Academy ........ 13
  Research Methodology Course Model ........................................................................................... 14

Recommendations ....................................................................................................................................... 15

The Initiative ............................................................................................................................................. 15
  Capacity-building and Needs Assessment ....................................................................................... 15

Faculty ..................................................................................................................................................... 17
  Faculty Workload and Compensation .............................................................................................. 17
  Faculty Recruitment .......................................................................................................................... 17
  Faculty Professional Development .................................................................................................... 17
  Faculty Credentialing ......................................................................................................................... 18

Students .................................................................................................................................................... 19
  Student Recruitment .......................................................................................................................... 19
  Student Recognition ............................................................................................................................ 19

Office of Undergraduate Research ......................................................................................................... 19

Valencia Faculty Conducting Undergraduate Research ........................................................................ 21

References .................................................................................................................................................. 24
Problem/Issue/Statement of Need

In 1998 the Boyer Commission presented ten recommendations for a significant reform of undergraduate education in US research universities. The first two recommendations (1) make research-based learning the standard and, (2) construct an inquiry-based freshman year, led to a drastic increase of undergraduate research programs and initiatives at colleges and universities nationwide (Padma, Ramana, & Reddy, 2014; Council on Undergraduate Research). Participation in undergraduate research at freshman and sophomore year is no longer an option, but a requirement. Recognized as a “high-impact practice,” in undergraduate research “the goal is to involve students with actively contested questions, empirical observation, cutting-edge technologies, and the sense of excitement that comes from working to answer important questions” (Kuh, 2008; Lopato, 2010). During the recent Strategic Planning process at Valencia “high-impact practices” were identified among the priorities of the college.

Community colleges play an important role in transforming higher education in the US. In 2013-14, 46% of all bachelor degree recipients in the US started at a community college (National Student Clearinghouse Research Center, 2015). Additionally, many UCF faculty report that the high student-to-faculty ratio at UCF makes finding a research position more challenging for transfer students (Sessions, L., personal communications, 2015). Therefore, there is a need for developing programs introducing and promoting undergraduate research at community colleges in general and at Valencia in particular.

Undergraduate research initiatives at community college have been encouraged by the Council on Undergraduate Research (CUR), and a number of professional organizations (American Chemical Society, American Physical Society, American Association of Physics Teachers, American Mathematical Society, American Association for the Advancement of Science, etc.). According to CUR, “community colleges provide educational opportunities for students to earn pre-baccalaureate certificates or degrees, transfer to four-year institutions, or complete workforce and skill development programs. Each of these respective types of students would be better prepared for the next step in their careers if they were able to participate in quality undergraduate research experiences” (Council on Undergraduate Research Programs for Community Colleges). Studies have shown that participating in undergraduate research gives students increased retention and transfer rates, increased confidence, greater self-efficacy in their chosen fields, better understanding of career goals, and better employment potential (Osborn & Karukstis, 2009; Russell,
More specifically, community college students “who engage in research are more likely to stay in science, transfer to a 4-year school, and pursue a higher degree” (McCook, 2011). Once Valencia college students transfer they are twice as likely to participate in formally-recognized undergraduate research activities at UCF when compared to first-time-in-college students (UCF Office of Undergraduate Research, 2014).

A number of community colleges nationwide have answered the call by joining CUR and developing undergraduate research programs and initiatives suitable for their students. Some Valencia faculty already involve their students in undergraduate research through introducing elements of research in their courses, mentoring and guiding their students in individual undergraduate research projects, and sponsoring students clubs (see Valencia Faculty Conducting Undergraduate Research). These students deserve credit and recognition for their work. A relatively small number of students enrolled in Valencia’s Honors program can participate in undergraduate research through the Seneff Honors College Undergraduate Research Track. However, as of today, Valencia does not have a college-wide initiative or program aimed at making undergraduate research available to all Valencia students nor does the college create standards and supports for the work already being done. Such an initiative needs to be established to provide the opportunity for a high quality inquiry-based learning experience for all Valencia students.

The Definition of Undergraduate Research

It is important that the undergraduate research initiative be to scale for a college that offers primarily A.A. degrees. The proposed activities must fit within the scope of research activities appropriate for an institution with teaching at the heart of its mission. The connection to teaching and learning must be clear within the constraints of a college primarily awarding two-year degrees. As McCook has noted (McCook, 2011):

‘Up to 18 hours a week giving lectures and running instructional labs is considered a typical course load for community college faculty members. In addition to lacking assistants, professors must send students, who may be gone after 2 years, into the field before they have acquired a solid academic foundation. And community college faculty members can’t really compete against larger, better-funded research teams. But their goal is to get students excited about science.’
It is also important that the research is authentic and useful to students and the broader field; it should not be ‘just a research paper.’ Therefore, the definition of undergraduate research is critical.

**Definition of Undergraduate Research**
CUR defines undergraduate research as “an inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline” (Council on Undergraduate Research, n.d.). Recently in meetings, CUR discussions lessen the importance of the original contribution factor, and expand the definition to add that the real goal is learning (Beck, M., personal communication, April 15, 2016). When it comes to freshman university levels and community colleges, it is well understood that undergraduate research experience starts with learning basic elements of research through inquiry-based labs and course embedded projects. In these terms, undergraduate research experience can be defined as “the practice of carefully formulating or addressing a question, problem or objective, analyzing it within a disciplinary or interdisciplinary framework, producing findings, conclusions, designs, or creative works, and clearly communicating and defending such to a critical audience” (The Carter G. Woodson Institute for African-American and African Studies at the University of Virginia).

As a leader in community college education, Valencia should aim to design an initiative that will allow introduction of elements of research to each Valencia student, as well as provide opportunity for exceptional Valencia students, planning to continue their education in medical schools, law schools, or research graduate schools, to make original intellectual or creative contribution to the field.

**Recommended Criteria for Defining Undergraduate Research**
Fortunately, there are excellent definitions for research in any discipline that can govern Valencia’s work (The Carter G. Woodson Institute for African-American and African Studies at the University of Virginia; Council for the Advancement of Standards in Higher Education, 2014; Brew, 2013). The committee would like to recommend four types of significant research projects that would cover all disciplines taken from The Carter G. Woodson Institute for African-American Studies at the University of Virginia. These four types carry simple and specific criteria for academic, applied, design-based, and creative research. They are listed here:

1. In an academic research project, a student will:
   - Form a research question based upon the relevant literature and/or observations.
• Collect pertinent data/information.
• Analyze data/information.
• Draw logical and defensible conclusions.
• Communicate clearly and effectively findings and conclusions.
• Defend the research to a critical audience.

2. In an applied research project, a student will:
• Identify a problem to be solved, or need to be addressed, based upon existing information.
• Collect pertinent data/information.
• Analyze data/information.
• Draw logical and defensible conclusions.
• Communicate clearly and effectively findings and conclusions.
• Defend the solution to a critical audience.

3. In a design-based research project, a student will:
• Define the problem and/or objectives.
• Identify prior designs or works from the literature.
• Generate concepts and design alternatives, establishing specifications.
• Model, analyze, test and evaluate conceptual designs.
• Create the design/work.
• Defend the design/work to a critical audience.

4. In a creative research project, a student will:
• Identify an aesthetic or creative conversation and a set of attendant questions inspired by that conversation (e.g. how might one write a series of original poems about familial incest?)
• Locate a gap or a problem within that conversation (e.g., how can such difficult, even transgressive material be approached in a manner that is not merely confessional and which is also artistically valid?)
• Gather data and inspiration from the relevant primary and secondary sources that will help address the specific gap or problem or question under consideration (e.g. read widely in confessional poetry and the literatures and literary critical treatments of incest; explore possible masks or personae to adopt from a range of mythologies and fables; read biographies, letters, and diaries by historical figures also concerned with similar material)
• Decide which method or combination of methods are most appropriate for embodying the student’s own project (e.g. choose to create a series of related poems whose speakers are very clearly drawn from mythology – Adonis and his parents, for example – and use the borrowed narrative structure to explore anachronistic and personal concerns of the student poet).
• Perform an analysis of the data (e.g. seek feedback on the poetic sequence in peer workshop settings and from the faculty advisor for the project).
• Produce a final project of original creative work that has grown out of the accumulated research, reading, workshop response, and private stores of material (e.g. a creative thesis or collection of poems on this theme that would be evaluated by an orals or honors committee)

Undergraduate research activities are discipline specific. Several examples from Valencia in different disciplines are provided here to illustrate the diversity of projects.

Examples of Undergraduate Research in Physics
Examples of undergraduate research projects in physics can vary from a modification of a traditional general physics laboratory experiment or solving a modified version of a classical physics problem to participation in data analysis for LIGO (Long Interferometry Gravitational Observatory, which recently first detected gravitational waves). Below are four examples of titles of undergraduate research projects presented recently at the National Meetings of the American Association of Physics Teachers (AAPT) and American Physical Society (APS):

Motion of a Ball on a Board Tilted about the Two Axes, poster SPS02.

Examples of Undergraduate Research in Social Sciences
As another example, an undergraduate research project in the social sciences discipline might take the format of observation and a research paper based upon a service learning experience. The design of the undergraduate research will require an Honors student to complete twenty hours of service learning within the discipline for major study (i.e., Anthropology, Economics, Education, History, Political Science, Physical Education, Psychology, Sign Language or Sociology).

The course outcome suggests the student will be able to research and discuss the selected topic. Twenty hours of observation from a faculty-selected pre-approved
agency are required, in order to gain an understanding of the benefits of the required service learning. Service learning outcomes will enhance academic understanding as a pre-professional exploration, and through engagement students will be able to document the benefits, analyze the agency’s needs, and reflect on the experience in a final reflection research paper. Along with the reflection research paper, assessment through a visual electronic presentation, in order to demonstrate achievement in learning from completing the service learning hours, will be required to culminate the post-service twenty hours by PowerPoint and/or poster presentation at a student symposium as determined by the faculty member.

Note that this example couples service learning with undergraduate research, but this link is not required. Faculty and students also do undergraduate research in the social sciences by means of surveys or experiments, not necessarily in the context of the Seneff Honors College or Service Learning. It should be emphasized also that the replication of published experiments, with or without minor variations should also qualify as undergraduate research.

Examples of Undergraduate Research in Technology-centric Disciplines
While undergraduate research in technological disciplines differs from undergraduate research in the sciences, it remains strongly related. Undergraduate research in technological fields is first and foremost applied research.

Student research in technological fields is focused on the creative application of scientific and engineering knowledge to practical problems. The goal is more the novel and effective application of knowledge than the discovery of new knowledge, the replication of existing studies or the development and extension of theory.

Examples include:

- Using statistical control charts to analyze and predict the performance of computer software,
- Development and calibration of instrumentation to measure temperature and occupancy of bat roosts,
- Application of automated imaging systems to the acquisition of cloud cover information for the prediction of photovoltaic panel efficiency,
- Construction and testing of an autonomously-navigated robot vehicle,
- Data acquisition and visualization of datasets from the web and crowd-sourcing, and
- Programmed characterization of electronic text, based using word frequencies and n-grams.
Given the close relationship between science and math and the applied research focus of technology-centric subjects, broadly interdisciplinary and collaborative research topics are particularly appropriate here.

An Undergraduate Research Initiative for Valencia College

The committee would like to recommend an undergraduate research initiative to be implemented over the next two years, building on nationally recognized models and current practices, while expanding the opportunities for students to partner meaningfully with faculty members pursuing a specific course of research.

Possible projects include:

1. Academic research
2. Applied research
3. Design-based research
4. Creative research

* Currently our Seneff Honors College Undergraduate Research Track provides a more structured mentorship experience IDH2912 (Honors Research Project – 1 credit) which lacks the resources needed to define and carry out an undergraduate research study.

Course Embedded Model

The incorporation of authentic research questions into existing courses has been called embedded (Investing in Impact: The Power of Undergraduate Research, Community College Perspectives, 2015), integrated (Valencia College Service Learning, n.d.), or course-based undergraduate research experience (CURE) (Wolkow, Durrenberger, Maynard, Harrall, & Hines, 2014; Bangera & Brownell, 2014). This model could provide for an individual research project, replacement of existing labs with inquiry-based labs, or a class project – any of these added onto an existing course. Often used in science laboratory classes, this model follows the shift in pedagogy in undergraduate science classes from traditional “cookbook” experiments to authentic research (Brownell, Kloser, Fukami, & Shavelson, 2012). For example, the Biotechnology Program at Jamestown Community College offers a
two-year program with intensive lab work in all the science classes with inclusion of undergraduate research components (Investing in Impact: The Power of Undergraduate Research, Community College Perspectives, 2015). One student reported on a project begun in the first year that continued through each course in the program, studying the expression of proteins in programmed death of bone marrow cells in a cancer biology project.

Irina Struganova (professor of physics at West Campus) reports that she uses a course embedded model currently at Valencia. Working in small groups, students utilized about three hours of class time and twenty hours outside of class time to complete a research project in PHY2049 (Calculus-based Physics II). The projects are chosen by students on selected topics outlined by Professor Struganova.

A format based upon the course embedded models above would offer several supports to the undergraduate research initiative. Classroom space, laboratory space, or other work spaces can be included in the course schedule. Acquisition of resources, materials, and supplies could be supplemented through course lab fees. Faculty compensation and workload are accounted for the course. Additionally, student recognition might be recorded by labeling research embedded courses on a student transcript with R. The process used to tag a course with an R would be same as the process currently being for service learning courses. Those that are offered within the General Education program would meet the designated outcome for that discipline (including critical thinking, information literacy, or ethical responsibility).

The embedded model may not be applicable to some courses and disciplines. Challenging academic courses such as advanced calculus, physics with calculus, and organic chemistry require a lot of time and dedication from students even without any additional projects. Additional projects may make the workload too high for both students and faculty.

Overall, we believe the course embedded model will be successful given the existence of two Valencia programs with similar format: Seneff Honors College Undergraduate Research Track (Valencia College Seneff Honors College, n.d.) and Service Learning (Valencia College Service Learning, n.d.). These models could help to define the framework for an undergraduate research program, but undergraduate research program should not be limited to these models since the work is very, very different.
Independent Studies Models
The independent studies model should enable exceptional individual Valencia students to get involved in undergraduate research. This model includes Mentoring and Independent Studies Research Course as sub-models.

Independent Studies: Mentoring
Mentoring is appropriate for students who have ideas for specific creative projects they would like to work on. The work is initiated, conducted, and completed by a student. The role of a mentor is to answer specific questions asked by a student, provide a feedback, and some guidance. Mentoring may not require a pre-developed curriculum or a completed product. Faculty mentors might not receive a monetary compensation, but hours spent by a faculty mentoring Valencia students could be counted as service to the college. Support for faculty compensation is provided in a small way thanks to the newly approved Faculty Incentive Plan where undergraduate research is listed as a high-impact practice for Valencia (Valencia College Learning Leadership Council: Completed Work Plans, n.d.). The Faculty Incentive Plan approved by the Learning Leadership Council in September 2015 for future implementation allows for up to $2,500 every two years for 50 hours of professional development in an area and 30 hours of documented action in said area.

An additional version of this sub-model might be co-curricular. This sub-model would provide for resources obtained from a student club or by applying for co-curricular funds from Student Development.

The resources needed to support this sub-model include: work space for the project; funding for new equipment and supplies (Harvey & Thompson, 2009; Kight, Gaynor, & Adams, 2006); compensation for a faculty mentor for the time beyond the ten hours of service to college; support for the large time investment for a faculty member; and student recognition for their work. While it is important to support an excited student with a good idea with mentorship, these barriers may limit the productivity of this activity. This model is included since it will happen organically, thanks to our students who are excited to do research, but who realistically have limited funds to pay for course credits.

For comparison sake, the mentor model described above is considered in relation to an example of a more structured mentoring model in place currently at Valencia: the Seneff Honors College Undergraduate Research Track provides IDH2912 (Honors Research Project – 1 credit) (Valencia College Seneff Honors College, n.d.). In this
course, students are paired with a faculty mentor for IDH2912 and the class is built individually for a student based upon their selection of mentor. The mentor is paid for the one-credit course and can have up to three students in one section. In the past, projects have been individual, but recently there are pairs of students interested in doing a joint project. Guidelines for the project product are being developed for fall 2016; however, these projects have been most often literature-reviews. As such, this model lacks the support to do undergraduate research. For example, there is no lab fee. In this course, it would be difficult to add a lab fee as most sections do not require consumable materials that must be documented for a course level lab fee (lab fees are at the course level not the section level). Thus, the next model is proposed.

Independent Studies: Research Course
The main difference from mentoring to the independent studies research course is course credit. In an independent studies research course, the faculty helps to identify a project for a student or students. The choice is based on the faculty expertise, student interest, ability of students, and resources available as evaluated by the faculty. Independent studies research courses should have a specific goal, final product, a learning/work plan, and an assessment plan.

Eastern Florida State College (EFSC) has a newly developed (2014) Office of Undergraduate Research (OUR) that began with an independent studies course model (Eastern Florida State College Office of Undergraduate Research, n.d.). Students perform research in an independent studies model for one course credit (for example, BSC 4911 Individual Mentored Research in Biology/Biotechnology). OUR at EFSC is provided $4000 annual budget from Student Government Association funds. Students may apply to these funds with their research proposals. The funds also provide for ten faculty and students to attend the Florida Undergraduate Research Conference. OUR provides a designated locked research space for disciplines that do not require a wet lab. It allows students access when the library is open and increases their research time since their mentors are not required to be there all the time.

Other colleges and universities offer independent studies research courses. For example at UCF, the Burnett School of Biomedical Sciences sponsors several versions. MCB4912 provides course credit with the number of hours and specific learning outcomes determined by the faculty mentor (Burnett School of Biomedical Sciences Undergrad Research FAQ, n.d.). UCF offers a zero credit course MCB 4912 that simply allows the experience to be listed on the student transcript without tuition costs.
At Valencia, independent studies research courses could be incorporated in college curriculum through “special topic” courses in a discipline. Lab fees can be included for disciplines that require it. Since it is a course, resources, work space, and faculty compensation are provided. Student recognition is built into this model since the student is awarded credit hours for the course, which are transferrable without equivalent to four-year programs in other U.S. colleges and universities and can be counted toward electives in a discipline. Irina Struganova had three students enrolled in her “special topics” physics course, which can be considered an independent studies research course. As someone who has experienced both the embedded model and the independent studies research model, Dr. Struganova feels that the independent studies model was a great learning experience for the students and herself, providing low faculty-to-student ratio along with dedicated resources and time.

**Research Internships Model**

This model is offered already under Internship and Workforce Services. Research Internships with potential employers would be the ideal situation for an undergraduate student. However, the limitation in the number of these positions available is one of the driving forces for an undergraduate research initiative at Valencia College. Additionally, the requirements of time and transportation may limit Valencia students’ ability to participate in such a model.

**Added Experience for Valencia Transfers to UCF: The Summer Research Academy**

Our motivation for increasing the undergraduate research offerings is, in part, to encourage successful transfer and their engagement in research majors leading to fulfilling careers. Specific support should be provided so our students are connected to the Office of Undergraduate Research prior to their transfer to the University of Central Florida (UCF.) Each summer UCF’s Office of Undergraduate Research sponsors the Summer Research Academy (SRA) for two and a half days during which undergraduate students from UCF and incoming transfer students from community colleges: learn about the nature of university research; meet with research faculty and other students active in research at UCF; learn about research opportunities available to undergraduate students at UCF; earn one credit for work before, during, and after the academy at no cost. Applications are due in early April and the SRA is held in June. While access cannot be guaranteed, we can develop a coordinated effort to prepare our students to apply in the spring before they transfer.
An example of the arc of experience for a Valencia College student who develops an interest in Undergraduate Research...

Possible projects include:

1. Academic research
2. Applied research
3. Design-based research
4. Creative research

Research Methodology Course Model

We recommend the UR initiative proposed here should be evaluated for its effectiveness in two years. Assuming that the foundational elements described here have been implemented there should be a review of innovations with an eye towards expanding offerings for faculty and students as needed (see: (Brothers & Higgins, 2008)). At that time, a research methodology course model might be added.

While the research methodology course model may be adopted in the future, it is not recommended currently for Valencia. This model provides for a course specifically on research methods and skills, techniques training, transferable skills, and ethics - usually in a specific discipline. Eastern Florida State College’s (EFSC) newly developed (2014) Office of Undergraduate Research expanded from the independent studies research course with a research methodology course model in 2012: BSC2910 Directed Independent Research – Biological Sciences (3 credits) (Eastern Florida State College Course Objectives and Plan Summary: BSC2910, n.d.). Now in 2016, there are eight such courses at EFSC in various subjects. According to Dr. Ashley Spring, biology professor at EFSC, demand is so high for undergraduate research that she has stopped using the individual mentoring model and now only offers the research methodology course with 30 students in it every semester (Sessions, L. personal communication, 2016). To support the course, a lab fee of $40 is included as well as a liability fee of $29.50 (based upon the nursing and health sciences program and recommended by the Florida College System Risk Management...
Consortium). After the methodology course, students may continue their research in an independent studies research model for one course credit (BSC 4911 Individual Mentored Research in Biology/Biotechnology). As mentioned above, OUR at EFSC is provided $4000 annual budget from Student Government Association funds that support research proposals and travel to research conferences. As mentioned above, the designated locked research space is a key component in the success of the EFSC program. It allows students access when the library is open and increases their research time since their mentors are not required to be there all the time.

Other colleges and universities have similar courses. For example at UCF, the Burnett School of Biomedical Sciences sponsors several versions of undergraduate research methodology courses (Burnett School of Biomedical Sciences Undergrad Research FAQ, n.d.). The Program for Undergraduate Research Experience (PURE) offers MCB 4920C Group Effort Applied Research (GEAR) for which 8-15 students receive one credit of Directed Independent Research or MCB 4941 Internship Practicum: Peer Instruction and Laboratory Occupational Training (PILOT) for three credits.

It should be noted that the Seneff Honors College Undergraduate Research Track offers a research process course (IDH2911) and individual research project course (IDH2912), demonstrating that this format works at Valencia and could be applied to undergraduate research methodology courses.

Currently, unless a particular requirement exists in the student’s degree, we see comparatively little need for a course entirely on research methodology at an A.A. College. For example, in the fields of engineering such courses would currently occur junior or senior year in the bachelor’s degree. There simply may not be a critical mass of students to fill such courses. Logistical difficulties in the A.S. programs constrain the number of credit hours that students can take.

**Recommendations**

**The Initiative**

**Capacity-building and Needs Assessment**

Capacity-building and further needs assessment would move us from the proposed initiative towards the systematic integration of undergraduate research activities through courses and faculty-student mentor experiences. Next steps would include: (a) analysis of the student survey results related to their NSF LSAMP research experiences (this is currently in progress); (b) a survey of faculty to more comprehensively capture their concerns and to inventory the undergraduate
research in progress (using the definitions by research type provided prior); and (c) a discussion with UCF’s Office of Undergraduate Research to further align our work-in-progress with their expectations and structure for our transferring students.

Given faculty concern for the ethical conduct of research a subcommittee of faculty and administrators will be convened to map out the points at which faculty and students learn and share information about Institutional Review Board (IRB) and related expectations for ethical conduct at Valencia. The work would aim to define consistent practices across the campuses, especially at entry points (such as new faculty orientation, beginning research courses for students, etc.)

We propose utilizing the six standards articulated by Glassick et al. (Glassick, Huber, & Maeroff, 1997) for evaluating research, adapting it in collaboration with our colleagues in Faculty Development. These standards are currently taught in the TLA course SOTL3270: IRB Requirements and Your Research. The six standards for research are: clear goals; adequate preparation; appropriate methods; significant results; effective communication; and reflective critique.

Given these activities and next steps, we propose that the initial development and implementation take place between Fall of 2016 and Fall of 2018. Within the first two months at the start of the initiative, faculty and administrators will define the goals and benchmarks for achievement to ensure that the implementation will be structured and the work-in-progress can be formatively evaluated across all campuses at the college-level. This work will be based on the national “Standards for Undergraduate Research Programs” articulated by the Council for the Advancement of Standards in Higher Education. Within that plan faculty development, recruitment and compensation are key. We have also sketched out possible next steps related to student recruitment and recognition.

After attracting ‘students that are hard-working and commit time to research,’ the second-most important need for success in undergraduate research is cited as ‘availability of resources and institutional support’ (Mancha & Yoder, 2014). CUR lists many resources to assist colleges in developing undergraduate research program (CUR Strategic Pillars, n.d.; Mabrouk, 2009). To accomplish the recommended undergraduate research initiative at Valencia College, there are many areas of the College called upon for support.
Faculty

Faculty Workload and Compensation

The idea that ‘research is teaching’ must be embraced for an undergraduate research initiative to be successful.

“Undergraduate research is not only the essential component of good teaching and effective learning, but also that research with undergraduate students is in itself the purest form of teaching.”

-James M. Gentile (Doyle, 2000)

Faculty workload must include undergraduate research as work whether as service to the college or as a credit course. Developing a research course and individual mentoring and instruction requires a lot of time from a faculty member. The amount of release hours or compensation needs to be established at the college level and correspond to the amount of work required from the faculty. Caution must be exercised to avoid adding to the faculty workload rather than replacing it (Hensel, 2012).

The embedded and independent studies research course models recommended above provide for faculty compensation through course structure. The mentoring model provides compensation through the Faculty Incentive Plan (Valencia College Learning Leadership Council: Completed Work Plans, n.d.) or through accounting for time in faculty workload forms.

Faculty Recruitment

Valencia has a large number of faculty with previous research experience who are experts in their field. If Valencia decides to support an undergraduate research initiative, a “call for faculty” can be sufficient to recruit.

Faculty Professional Development

Professional development courses for faculty engaged in undergraduate research should include topics such as mentoring, research methods, good project design and formulating a research question, and ethics including Institutional Review Board information. The curriculum that comprises a research methods course should be the basis of at least one professional development class since any faculty in any model of undergraduate research should ensure students understand these basic skills. Currently through the Honors College, Valencia has LFMP6340: Mentoring Students in Undergraduate Research (Valencia College Seneff Faculty Development Program, n.d.).
This course will provide the essential skills required to mentor honors students enrolled in the Undergraduate Research Track (IDH2912) course. Mentoring students in this track requires that the faculty member facilitate students in determining their research, establishing a research question, and conducting research specific to the mentor's own discipline. In addition, mentors will be responsible for guiding students in the presentation of their research in a formal setting in accordance with the guidelines set by that forum. Note: This is an optional course for the Seneff Faculty Development Program.

This course is required for faculty mentoring students in the Honors Undergraduate Research Track who do not meet alternative credentialing.

As described in the Honors model, an alternative pathway often may be desirable in many cases. It may be more beneficial to allow an interested faculty to attend a professional workshop or a conference in their discipline rather than a “one-size-fits-all” in-house professional development course. Dean oversight is suggested in this area as described under credentialing below.

**Faculty Credentialing**

Credentialing for faculty as research supervisors should be considered. In a meeting about Valencia’s Institutional Review Board (IRB) and Related Matters hosted by Laura Blasi on 3/29/16, many concerns and questions related to IRB and even Institutional Animal Care and Use Committee (IACUC) oversight were shared in examples of proposed research. Professors who facilitate research projects should be well-trained in that research through their graduate training and must be capable of providing a safe and positive experience as well as be compliant with research regulations. To do this, faculty guiding research must have documented research experience in a discipline. Faculty teaching research courses must demonstrate also that they stay current in their field. For example, faculty might attend at least one conference related to their research every two years. The funding for this professional development is already available through individual Staff and Program Development (SPD) funds.

The Work Team recommends oversight by the individual deans with assistance from relevant departments such as laboratory managers, Compliance and Safety Department, and IRB.
As we see an increase in the promotion of undergraduate research at Valencia College, we must ensure that these experiences are appropriate and safe for the students. Under no circumstances should a student be performing research under the authorization of Valencia without faculty supervision. The requirement of a faculty supervisor for student research is standard in higher education.

**Students**

**Student Recruitment**
Faculty interested in recruiting students can advertise opportunities in their courses. For example, Keith Malmos, biology professor at East Campus, administers a student interest survey regarding undergraduate research in his classes with great response. College-wide, student recruitment could occur through a website listing faculty projects for students to find a match to their interests.

Academic advisors, program advisors, and internship coordinators need to be informed to be able to encourage students to take advantage of research opportunities. Once the models are defined, Academic Affairs must partner with Student Affairs in the recruitment efforts.

**Student Recognition**
Student recognition could occur on the student official record through course credits, use of the R to designate research embedded courses and independent studies research courses, and a listing of research hours on the transcript. Recognition for student accomplishments, beyond the academic transcript, would eventually be documented within the co-curricular transcript if one is established by Student Affairs. After the second year of the implementation of the Undergraduate Research Initiative, student incentives would need to be reviewed. For example recognition at graduation, following the approach used by the Honors program, might be appropriate to consider at that time.

**Office of Undergraduate Research**
To organize resources, a centralized office and director are recommended to begin the undergraduate research initiative (Hensel, 2012). The Work Team recommends designating a faculty member as undergraduate research director with full release time for two years to build the program, create collaboration opportunities, and seek grant funding. (Cost for an 8 month replacement at the doctoral level would be $49,464 plus benefits.) Again referring to the Eastern Florida State College Office of
Undergraduate Research, a key component of their initiative is to hire a full-time director this summer.

It will be necessary to have a space for research, either college-wide or campus-wide labs equipped with spectrometers (UV-Vis, Fluorescence, IR, etc.) and optics and engineering equipment that can be used for undergraduate research in various disciplines. Such labs require space, equipment, and a lab manager, and, therefore a college-wide initiative.

A necessity for recognition, promotion, and the process of research is the creation of a Valencia college-wide undergraduate research showcase, either annually or each semester. These showcases are often the genesis of undergraduate research initiatives, as was the case at both UCF (UCF Showcase of Undergraduate Research Excellence, n.d.) or EFSC (Eastern Florida State College Spring Undergraduate Research Exhibition, n.d.). It is recommended that Valencia begin this showcase as soon as possible. Already, small scale showcases occur with East Campus Honors College Undergraduate Research Track and Osceola Campus National Science Foundation Louis Stokes Alliances for Minority Participation program. It will be beneficial to offer a larger forum for these activities, college-wide.

Additionally, Valencia should encourage student presentation at local, low-cost conferences (Florida Undergraduate Research Conference (FURC), Florida Academy of Sciences (FAS), etc.) with funding, following the steps outlined by Student Development for representing Valencia at a conference/meeting. Support should also be provided for publication in peer-reviewed journals, such as the American Journal of Undergraduate Research (AJUR) or other journals in discipline.

This report considered feedback from the Learning Leadership Council in January. A small core of faculty wrote the report, and then it was shared with a larger college-wide group consisting of the following people: Cheryl Robinson (Honors, UGR Track) Laura Blasi (Assessment IRB).

**Planning Team:** Denise Ross, Diane Dalrymple, Eunice Laurent, Irina Struganova, Jane Maguire, Jerry Reed, Karene Best, Keith Malmos, Kristeen Christian, Laura Sessions, Linda Herlocker, Lynn Dorn, Mary Beck, Rick Dexter, Robyn Brighton, Sidra Van De Car, and Nick Bekas.

Finally, if the work plan is approved, the group realizes a more detailed budget request would have to be developed. It may include the following: release time for a coordinator, CUR membership for planning team members; conference attendance, and copies of books and materials necessary for a deeper understanding of undergraduate research.
Valencia Faculty Conducting Undergraduate Research and Members of the Work Team

An initial list of Valencia faculty that are conducting undergraduate research follows. This list was compiled from the Seneff Honors College and reporting from deans on each campus. It may not be complete, further demonstrating the need for a centralized initiative for undergraduate research at Valencia.

**East:**

| Melissa Schreiber (Biology) | Dale Maynard (Psychology) |
| Keith Malmos (Biology) | Diane Ciesko (Psychology) |
| Olga Vazquez (Biology) | Sean Lake (Humanities) |
| Louis Holliday (English) | John DiDonna (Performing Arts) |
| Jolene Rhodes (Math) | Kim Long (Speech) |
| Nicole Hill (Humanities) | Jane Maguire (Education) |
| Eric Wallman (Humanities) | Jim Adamski (Earth Science) |
| George Brooks (Humanities) | Jennifer Taylor (Humanities) |
| Vasudha Sharma (Chemistry) | Ryan Rilea (Political Science) |
| Rita Luther (Biology) | Anna Sintil (NSE) |
| Eli Brainard (Biology) | Bonnie Oliver (Economics) |
| Victor Bondzie (Physics) | Hatim Boustique (Math) |
| Marie Trone (Biology) | |

**Osceola:**

| Rick Dexter (Biology) | Brian Sage (Biology) |
| Denise Ross (IT/STEM) | Tim Grogan (Biology) |
| Dheeraj Verma (Biology) | Flora Chisholm (Biology) |
| Tim Barnett (Chemistry) | Gregg Scible (Math) |
| Melody Boeringer (Chemistry) | Jon Stevens (Math) |
| Ola Martin (Biology) | |

**West:**

| Dr. Eunice Laurent (Biology) | Jerry Reed (Computer Program) |
| Dr. Irina Struganova (Physics) | Resham Shirsat (Sustainability) |
| Mary Beck (Geology) | Colin Archibald (Computer Program) |
| Susan Matthews (Biology) | Richard Gonzalez Diaz (Biology) |
Members of Work Team:

Cheryl Robinson, Denise Ross, Diane Dalrymple, Eunice Laurent, Irina Struganova, Jane Maguire, Jerry Reed, Karene Best, Keith Malmos, Kristeen Christian, Laura Blasi, Laura Sessions, Linda Herlocker, Lynn Dorn, Mary Beck, Rick Dexter, Robyn Brighton, Sidra Van De Car, and Nick Bekas.

Annual Project Timeline

<table>
<thead>
<tr>
<th>Step, Task, or Deliverable</th>
<th>Lead Person</th>
<th>Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of Initiative (other meetings to be determined)</td>
<td>TBD</td>
<td>June 1</td>
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<tr>
<td>State Assessment Meeting conversation (this year speaker and workshop – ethical reasoning in undergraduate research – related conversation about systemic integration of ethics conversation across the initiative or plan to address this).</td>
<td>TBD</td>
<td>June 15</td>
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<tr>
<td>College-wide check-in - status and progress of four elements proposed for the initiative.</td>
<td>TBD</td>
<td>Sept. 15</td>
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<tr>
<td>Discussion of evaluation and status of activities for spring.</td>
<td>TBD</td>
<td>Feb. 1</td>
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<tr>
<td>Annual evaluation discussion.</td>
<td>TBD</td>
<td>April 1</td>
</tr>
<tr>
<td>LLC Update</td>
<td>TBD</td>
<td>May 1</td>
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Evaluation Plan

Details are provided in the document to include:

(a) analysis of the student survey results related to their NSF LSAMP research experiences (this is currently in progress); (b) a survey of faculty to more comprehensively capture their concerns and to inventory the undergraduate research in progress (using the definitions by research type provided prior); and (c) a discussion with UCF’s Office of Undergraduate Research to further align our work-in-progress with their expectations and structure for our transferring students.

Given faculty concern for the ethical conduct of research a subcommittee of faculty and administrators will be convened to map out the points at which faculty and students learn and share information about Institutional Review Board (IRB) and related expectations for ethical conduct at Valencia. The work would aim to define consistent practices across the campuses, especially at entry points (such as new faculty orientation, beginning research courses for students, etc.)

Full evaluation plan to be mapped out with stakeholders.
References


College of Medicine, UCF. (n.d.). *Burnett School of Biomedical Sciences Undergrad Research FAQ.* Retrieved from Burnett School of Biomedical Sciences: https://med.ucf.edu/biomed/academics/student-research/undergrad-research-faq/


UCF Office of Undergraduate Research. (2014). Office of Undergraduate Research Participants Student Admit Type by Population and Research Year.


