JCAPS

ASSESSING THE IMPACT OF AN ARTIST-IN-RESIDENCE PROGRAM ON COLLEGE STUDENTS IN ARTS, SOCIAL SCIENCE AND STEM FIELDS

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This study[1] examines the impact of Artist-in-Residence (AiR) programs on college students' creative behaviors. By surveying undergraduates, we found that art majors, compared to nonmajors, exhibited greater intentions to engage in creative behaviors following interactions with the AiR. These students also felt more social pressure to be creative, valued leadership for creativity, and identified professional behaviors influenced by AiR interactions. Participants reported several areas where the AiR is helpful, such as understanding how to create artwork that makes difficult topics accessible to the public. This study addresses a literature gap by documenting how an AiR program affects college students and found multiple significant positive impacts on creative behaviors and intentions. These beyond-the-classroom experiences highlight the importance of campus activities in connecting and engaging students. The study underscores the significance of intentional participation and sustained interactions in promoting personal development and a supportive university environment. Limitations and future research are discussed.

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Introduction and Literature Review

This brief literature review begins by emphasizing recent attempts to define creativity. The primary focus on preschool and later phases of life indicates a research gap in the college years. The National Endowment for the Arts (NEA) identified the need to bring the arts into K-12 classrooms since the 1960s. Artist-in-Residence (AiR) programs were introduced as a pedagogical method to enhance creative cognition in STEAM college students starting in the late1980s. Efforts to assess the influence of the arts on students' cognitive development began in the early 2000s.

Creativity: Recent Attempts to Redefine a Notion Eluding a Universal Definition

One of the challenges facing the scholarship around creativity is the lack of a unified and universally accepted definition. In 2012, *Creativity Research Journal* dedicated its first issue to define creativity from multiple perspectives. Among the contributors, Runco and Jaeger (2012) try to bring back studies from the 1930s by claiming that creativity involves "originality" (referring to something that is "unusual, novel, or unique") and must be paired up with "effectiveness", which is defined as "usefulness, fit, or appropriateness" (p. 92). Both originality and effectiveness need to be present, for something to be defined as creative. In the same year, Batey (2012) referred to a previous 2006 study co-authored with Furnham, lamenting the "lack of a clear and widely accepted definition for creativity, which, in turn, has impeded efforts to measure the construct" (p.55); against the confusion within the many definitions proposed over the years, Batey offered "a novel heuristic framework with which to understand how creativity may be assessed," aiming to integrate different perspectives (p.55). Batey claims that the predominant definition of creativity as "originality and utility" is a Western construct that originated as divine intervention in the Genesis, and then progressively morphed into the fruit of human achievement (think about Humanism, which informed most of the Renaissance and subsequent eras); such definition contrasts with the notion, predominant in Eastern culture, of creativity as "self-growth" (p.56). An understanding of creativity as the achievement of the human genius under divine intervention (think of Michelangelo) makes framing the concept in more specific terms all the more elusive. Batey (2012) also surveyed several studies in psychology since the second half of the XX century, which focused on personality, or on problem-solving, or in the context that promotes creativity (p.56). Batey added that most of the consensus has coalesced around the identification of creativity as involving the "new and useful" (p.56), as well as on four conditions that enable creative behaviors, which Batey illustrates in his essay by using a three-dimensional diagram. This expansion of the notion of creativity, to which Batey refers, was first theorized by Mel Rhodes in an essay published in 1961, referring to four areas as "the 4Ps of creativity":

> One of these strands pertains essentially to the person as a human being. Another strand pertains to the mental processes that are operative in creating ideas. A third strand pertains to the influence of the ecological press on the person and upon his mental processes. And the fourth strand pertains to ideas. Ideas are usually expressed in the form of either language or craft and this is what we call product. Hereafter, I shall refer to these strands as the four P's of creativity, i.e., (1) person, (2) process, (3) press, (4) products (Rhodes, 1961, p.307).

A review of the available research and literature on creativity reveals a primary focus on creativity development on preschool groups (Dere, 2019) and in a later phase of life (Alpaugh et al., 1982;

Simonton, 1990; Marsiske & Willis, 1995; Hickson & Housley, 1997; Haanstra,1999; Edelson, 1999; Sierpina & Cole, 2004; Chacur et al., 2022). This exploratory research fills a gap in knowledge at the higher education level by focusing on the college experience through the examination of the relationship between students' everyday creative behaviors and interactions with an AiR program in higher education. When creativity is seen through the lens of student engagement in campus activities, it becomes evident that fostering creativity in higher education requires a holistic approach. By integrating out-of-the classroom experiences that contribute to students' personal development and by encouraging students from all majors to become more vested in their education through participation, higher education institutions can create an environment that not only nurtures creativity but also supports the overall growth and well-being of students.

The Introduction of Arts and Artist-in-Residence (AiR) Programs as Educational Tools into the Classroom

In the 1960s, with a baby boom generation increasingly hungrier for culture and education (Bauerlein & Grantham, 2009, p. 10), the newly founded National Endowment for the Arts identified the need to bring the arts into classrooms from kindergarten through high school (K-12), with a focus on "the effectiveness of the arts as an educational tool" (Sautter, 1994, p. 434).

During the 1970s, as education enrollments expanded and the endowment budget for Artists in the Schools increased, NEA "sent more than 300 artists into elementary and secondary schools in 31 states" (Bauerlein & Grantham, 2009, p. 36). However, the overall impact on students was limited. In 1977, Peter Lipman-Wulf lamented that "the importance of art in primary and secondary schools is stressed, but how to go about it is treated very vaguely" (Lipman-Wulf, 1977, p. 46). Rather than having students observe an artist at work, Lipman-Wulf introduced a system of pedagogical interactions between the artist, students, and teachers, thus fostering a more engaging learning environment.

More recently, Artist-in-Residence (AiR) programs have garnered growing interest across the STEAM disciplines (science, technology, engineering, arts and mathematics) as a pedagogical method to enhance students' creative cognition. In 1988, Pennsylvania State University College of Engineering introduced an AiR program titled "Interdisciplinary Projects in Art and Technology," open to seniors in engineering and the visual arts. The aim was to help engineering students grow their awareness of the impacts technology has on individuals and societies based on the products that they produce (Mathews et al., 1990, pp. 229).

During the 1990s, awareness grew regarding the limitations of prior descriptive assessment measures in the AiR programs, especially when correlating the arts and student learning through discovery, integration, or application. It is interesting to note that this concept paralleled the 1990 publication of Boyer's theory of Scholarship of Teaching and Learning (SoTL). Bumgarter wrote in 1994, that, "even the most fundamental questions about the outcomes associated with the residency program have never been adequately addressed-either by the National Endowment for the Arts or by the arts education community" (Bumgarter, 1994, n.p.), including how students benefit and what they learn from the AiR programs. Sautter (1994) observes that "This body of research does not demonstrate firm, cause-and-effect conclusions about the effectiveness of the

arts in stimulating learning. Indeed, not enough questions have been asked and not enough research data have been collected" (p. 435).

In the early 2000s, NEA partnered with the U.S. Department of Education (DoE) and other entities to sponsor two critical reports issued by the Arts Education Partnership (AEP), to assess the influence of the arts in students' cognitive development in K-12 education: *Critical Links: Learning in the Arts and Student Academic and Social Development*, 2002, and *Critical Evidence: How the ARTS Benefit Student Achievement*, 2005 (Bauerlein & Grantham, 2009, p. 122). In particular, the 2002 study focused on helping K-12 students learn cognitive and creative thinking skills through a wide variety of arts including dance, poetry, theater and the visual arts. The study found that "artistically talented students engaged in more self-regulatory behaviors during classes in which the arts were integrated into the lesson (Deasy, 2002 p. 64), but suggested a need to define more specifically the concept of "arts integration program" (Deasy, 2002, p. 65). Data provided in the 2006 study by Ruppert correlates the number of years of arts courses with a steady increase in verbal and math SAT scores (Ruppert, 2006, p. 9). Ruppert claims that "children's ability to draw inferences about artwork transferred to their reasoning about images in science" (Ruppert, 2006, p. 13), thus underscoring the positive impact that exposure to the arts has on the learners' intellectual development in other fields.

In the 2010s, the lens of cognitive psychology was used to examine the impact of AiR programs. Sanders (2014) studied a 2011-2013 AiR established by the Corcoran Gallery of Art within an after-school art program. He found a correlation with the development of life skills in students, such as "critical thinking, collaboration, and peer-interaction," and adds that "After-school art programs provide an environment suited for embracing these skills that are commonly outweighed by the need to raise test scores in traditional public school" (Sanders, 2014, p. 3).

Methods

The Goals of This 2022 NEA-Sponsored Study

Our 2022 NEA-sponsored exploratory study aimed at investigating college students' enhanced creative behaviors following participation in the Stuart Artist-in-Residence program, hosted by the School of Design at our institution. Each year, one artist is selected from a national pool of applicants to be in residence during the month of September and make art at the Ritz Gallery, located in the visual arts building. During this period, the artist interacts with students through various forms that include a public lecture, invited class reviews, daily studio hours, and an open studio event at the end of the AiR residency.

Our team combined the use of Batey's Biographical Inventory of Creative Behaviors (BICB) and Ajzen's Theory of Planned Behavior (TPB) within an interdisciplinary research framework. This approach merged methods from theories of creativity, social sciences, and Scholarship of Teaching and Learning (SoTL), extracting both qualitative and quantitative data. The goal was to provide a comprehensive analysis of the AiR program's impact on STEAM students by measuring students' self-reported awareness of creative behaviors and their intentions to engage in these behaviors.

This study included undergraduate students from science, social science, and art disciplines. We have added social science students to further enhance the experiment by Furnham et. al., in the UK

(2011), which was limited to art and science students. By taking on a broader approach, we aim to build on previous research and offer new insights into the role of interdisciplinary on-campus interactions in fostering creativity, thus filling the identified knowledge gap on the impact of AiR within higher education.

Batey's Biographical Inventory of Creative Behaviors (BICB)

In 2007, following his Doctoral dissertation, Mark Batey formulated the Biographical Inventory of Creative Behaviors (BIBC). This inventory consists of 34 selected behaviors: some of them align with a general understanding of creativity, like writing a novel or making a sculpture; some others, such as organizing an event, are not commonly perceived as creative, but they produce outcomes whose processes require a deeper integration of creativity with soft skills, such as leadership, communication, organization, and problem-solving. The criteria adopted to select these specific behaviors among innumerable possibilities remain unclear in current scholarship; however, the inventory itself has been tested for reliability with successful outcomes by Silvia et al. in 2021. In general, "self-report assessments, such as rating scales and behavior checklist, to measure engagement in everyday creativity," can potentially be less accurate, but they are applicable to numerous populations (Silvia et al., 2021, n.p.). The authors identified large umbrella themes within Batey's inventory activities related to creativity in writing and in the visual arts, "intellectual and scientific activities," and "interpersonal activities," which include leadership. (Silvia et al., 2021, n.p.). Batey's BICB was chosen for this study because it limits the measurement of creative behaviors to activities done within the last 12-month period. This approach is more accurate for testing a smaller record of accomplishments from undergraduate students, who are forming behavioral habits, as opposed to other scales that focus on creative accomplishments over a lifetime. Dollinger's CBI Creative Behavior Inventory is limited to activities of arts and crafts nature (Silvia et al., 2021), making it suitable only for studio art students.

Batey illustrated Rhode's 4Ps heuristic framework to measure creativity by considering three levels of approach: 1) The level "at which creativity may be measured": individual, team, organization, culture. 2) The "facet of creativity": trait (person), process, press (environmental context), product; 3) The measurement that is used, whether objective (hard data from output), subjective (individual's or team's self-perception), or other ratings such as cultural (involving experts in assessing the value of a culture's creativity) (Batey, 2012, pp. 59-60).

Our study considers the subjective individual level of students' self-rating as the approach to measure the process facet of creativity through those actions listed in Batey's 2007 Biographical inventory of Creative Behaviors. This approach emphasizes the AiR as a campus activity that provides opportunities for experiences beyond the classroom for majors within and outside of the visual arts. Students can choose their level of investment in the university experience. The sustained and shared interactions within a creative environment foster personal meaning-making, engagement, and personal growth.

Ajzen's Theory of Planned Behavior (TPB)

Scholars have found that an individual's "level of intrinsic motivation" (Choi 2012, p. 682), which includes finding "opportunities for improvement", or "willingness to try risky options", and confidence in one's ability to achieve a goal, defined by Choi as "self-efficacy" (p. 683), enables

them to react more favorably to "creativity-enhancing contextual factors" (p. 683). In this study, these factors correspond to the Stuart Artist-in-Residence program. Choi used the TPB-Theory of Planned Behavior to explain the correlation between creative behavior and context, which in our case corresponds to our students vs. the artist-in-residence program.

The TPB or Theory of Planned Behavior (Ajzen, 1985) is a widely used model to predict people's behavior based on multiple factors. It is used by health professionals to predict a person's likelihood of texting while driving, engaging in pro-environmental behavior, or adhering to a prescription regimen. The theory assumes that a person's behavior is correlated to their intentions to engage in the behavior. Intentions can be traced back to the person's attitudes toward the behavior, subjective norms about the behavior, and perceived behavioral control.

According to Ajzen (2002), the combination of "attitude toward the behavior," (attitudes) beliefs about other people's expectations ("subjective norm") and perceptions about their ability to control their engagement in the target behavior ("perceived behavioral control") shape the individual's intention to engage in a behavior. In this way, intentions to engage in a target behavior can precede the target behavior (p. 665).

In August 2022, the research team prepared and uploaded Batey's 34 questions, which in the pilot study were administered on paper, into QuestionPro, to be accessed online by the student participants. Several classes were identified as part of the study and consensus from the respective course instructors was sought. These classes included music, studio art, design, biology, psychology, math, and civil engineering. However, most of these were general education classes, therefore including students from any majors. For this reason, it made more sense to look at the demographic data and categorize students by major. The total number of students surveyed in the pre-phase was 390, and 309 in the post-phase.

The Batey survey asks about having engaged in creative behaviors within the past twelve months; therefore, the instrument was used to measure all the involved students' self-perception of creative behaviors prior to the intervention of the AiR, irrespective of their choice on whether or not to become engaged in interactions with the artist in the following weeks of the AiR program. In addition to asking individuals to self-report their creative behaviors using the BICB, we have examined people's intentions to engage in creative behavior.

Francis et al. (2004) suggest the target behavior should be defined with careful consideration of "its Target, Action, Context, and Time (TACT)" (p. 8). The overarching goal for the NEA-sponsored AiR study was to gauge students' intention to engage in behaviors considered creative in the three months following interactions with the AiR. The outcome for the NEA AiR grant will be "In the next 3 months, I intend to engage in behaviors that are considered creative." In this example, the Target is the required student, the Action is increased creative behavior, the Context is the AiR program exposure (or control), and the Time is the next 3 months following interactions with the Artist-in-Residence. For the outcome above the following items would measure intentions, attitudes, subjective norms, and perceived behavioral control. The contextual limitations of this study will be discussed in the appropriate section.

In all cases, participants responded to questions based on the theory of planned behavior on a scale from 1 to 7. Following best practices for survey construction to limit "lazy" responding, we varied the judgment associated with the ends of the scale. For example, for some questions, a response of "1" indicated strong agreement and "7" indicated strong disagreement. Finally, participants' responses were re-coded so that higher numbers always represented more positive attitudes, higher intentions, greater perceived subjective norms, and behavioral control.

To measure attitudes toward engaging in the target behavior we asked participants to respond to the question: "Increasing my creative behaviors in the next three months is..." harmful (1) to beneficial (7), good (1) to bad (7), pleasant for me (1) to unpleasant for me (7), worthless (1) to useful (7). To measure intentions, we asked participants to respond to three similar questions (e.g., "I expect to engage in behaviors that are considered creative in the next 3 months."). To measure perceived social norms, participants responded to three similar questions (e.g., "It is expected of me that I increase my creative behaviors in the next 3 months."). To measure perceived behavioral control, participants responded to four questions in total, made up by two questions to evaluate self-efficacy (e.g., "I am confident that I could increase my creative behaviors in the next 3 months.") and two questions to evaluate controllability ("Whether I increase my creative behaviors in the next three months is entirely up to me"). The team chose to set the timeline for measuring self-reported future interactions to three months, before the winter break started and students would disperse. Both questionnaires were submitted to the students in the classroom setting electronically through QuestionPro as a pre-test before their interactions with AiR (planned during the period of September 6-30, 2022), and then as a post-test in December (see Table 1).

Results and Discussion

By using participants' self-reported academic majors, we categorized students into a Major Condition consisting of an Arts group (e.g., Graphic Design & Studio Art), a Social Sciences group (Psychology, Education) and a STEM (Animal Science, Exercise Science, Nursing) group. Note, although Music Education, English, and Architecture could reasonably be considered "Arts" majors, they were not included as such here because the Artist-in-Residence program was more so targeting studio arts majors. Students in graphic design and studio arts had the most contact with the Artist-in-Residence.

Participants also reported several demographic characteristics regarding their gender identity, race, academic year, and first-generation college student status Participants in the final sample consisted of 68.8% female gender identity, 28.3% male, and 1.5% gender non-conforming. Options for "different gender identity and those preferring not to say constituted less than 1%. Nearly 90% of the sample reported Caucasian or white racial/ethnic identity. The remaining 10% of the sample reported Hispanic or Latino (2.4%), Asian (2.4%), African American or black (2.0%), Multiracial (2.0%), American Indian or Alaska Native (1.0%), and Native Hawaiian or Other Pacific Islander, Other, or preferred not to say (0.5%, 0.5%, and 0.5% respectively). The majority of students in the final sample were freshman (55.1%) followed by sophomore, junior, senior and other (20.0%, 12.7%, 9.8%, and 2.0% respectively). Finally, 11.7% of the sample reported being a first-generation college student.

We employed a mixed randomized repeated-measures research design to assess the impact of the Artist-in-Resident program. The independent variables in this research design were students' Major Condition (Arts, Social Sciences, or STEM) and the Time Period participants responded to the survey (Pre or Post)—either before or after their potential interactions with the AiR. Survey responses encompassing Batey's Multiple dependent variables were assessed.

Comparisons between the Arts, Social Sciences, and STEM groups were robust. In the final analysis, we examined responses from 193 individuals (n = 48 in the Arts condition, n = 73 in the Social Sciences condition, and n = 68 in the STEM condition). Using analysis of variance (ANOVA) statistical procedures, several effects that are important to the research questions were uncovered, leading to multiple conclusions about the impact of the arts curriculum during one semester (Fall 2022). With the current research design and analysis, three types of statistical effects can be evaluated. The first statistical effect is a *main effect* of Major Condition. Related to this main effect, the analysis reveals whether there were differences in Major Condition on the BICB or TPB survey questions regardless of Time Period. The second statistical effect is a *main effect* of Time Period. Here, the analysis reveals any differences on the BICB or TPB survey questions regardless of Major Condition. The third and most important statistical effect is the *interaction effect* between Major Condition and Time Period. Statistical interactions consider the simultaneous effect of Major Condition and Time Period. Statistical interactions in this study reveal whether the Artist-in-Residence program had an impact on the students that had the most contact with the artist. In other words, significant interaction effects reveal whether the Artist-in-Residence intervention was successful in encouraging more creative behaviors among respondents.

Results are presented below in the order of Theory of Planned Behavior, Batey's Inventory of Creative Behaviors, changes in conceptions about what creativity involves, and professional behaviors. Given the research was designed to measure changes in intentions, attitudes, behaviors, etc. from before the AiR events to after the AiR events, we devote special attention to pre- and post-survey responses in addition to differences between groups.

Theory of Planned Behavior

Analysis of the results for the theory of planned behavior questions reveal a significant *main effect* of Major condition on intentions to engage in creative behaviors in the next 3 months. This means there are differences between students based on their academic major ($F(2, 186) = 17.71$, $p = .007$, $\eta^2_p = .16$) regardless of the Time Period the responses were given. Follow-up post-hoc tests reveal that participants in the Arts Major Condition have significantly greater intentions to engage in creative behaviors overall ($p < .001$). There is also a significant main effect of Time Period whereby participants' intentions to engage in creative activities significantly decrease, albeit slightly, from pre- to post-survey ($F(1, 186) = 7.38$, $p = .007$, $\eta^2_p = .04$). The *interaction effect* is not significant.

For attitudes, there was a significant *interaction effect.* Specifically, respondents from in the Arts Major Condition have more positive attitudes about engaging in creative behaviors on the post-test survey compared to the pre-test survey ($F(2, 184) = 4.73$, $p = .01$, $\eta^2_p = .049$). In contrast, respondents in the Social Sciences and STEM Major Conditions have more negative attitudes about engaging in creative behaviors at post-test compared to pre-test surveys.

In the area of perceived subjective norms, participants in the Arts condition feel significantly more social pressure to engage in creative behaviors compared to the other participant groups ($F(2, 182) = 15.63$, $p < .001$, $\eta^2_p = .147$). The *main effect* of Time Period and *interaction effect* are not statistically significant. Lastly, the *main effects* of Major Condition and Time period and the *interaction* effect are not statistically significant in the area of perceived behavioral control.

Batey's Inventory of Creative Behavior (BICB)

The results indicated that, on average, participants in this study report engaging in approximately 8 of the 34 creative behaviors included on the BICB at both pre-test ($M = 7.9$, $SD = 5.63$) and post-test ($M = 7.7$, $SD = 5.94$). Overall, participants in the Arts Major Condition endorse significantly more creative behaviors, approximately 10 out of 34 creative behaviors, compared to the other participant groups ($F(2, 187) = 4.59$, $p = .011$, $\eta^2_p = .047$). However, there are minimal changes over time, specifically the *main effect* of Time Period and the *interaction effect* are not significant.

What is Involved in Creativity?

Commonly accepted definitions of creativity include characteristics such as originality and usefulness. In this study, we explored additional descriptive characteristics that students may endorse as being important for creative behaviors. Not only did we ask participants to indicate to what extent originality and problem-solving were involved in creativity, we also asked participants to indicate the extent to which mentorship, imitation, research, iterations, and other facets were involved in creativity. Because of the pre- and post-survey research design, we also examined change over time.

Responses from participants in the Arts condition indicated a significant positive change about leadership and imitation. Specifically, a significant interaction ($F(2, 179) = 5.09$, $p = .007$, $\eta^2_p = .054$). Follow-up post-hoc tests reveal that participants in the Arts condition endorse leadership as being more important for creativity from pre- to post-survey whereas participants with Social Science majors decrease and participants with STEM majors increase minimally. The value that art students place on leadership as part of creativity is an encouraging result of the AiR interactions tested in this study: it is a sign of art students' awareness of a crucial life skill, which carries positive repercussions in students' lives beyond the art major and corroborates the aforementioned correlation made by Sanders between extracurricular art programs and the development of soft skills.

The connection between creativity and leadership has been revealed by Guo, Gonzales, and Dilley (2016) through extensive literature review. The key findings point at the vital role creative thinking plays in developing effective leadership that enables complex problem-solving and opportunity identification as necessary skills to compete and thrive in an uncertain and ever-changing world (pp.127-128). Secondly, participants' responses to the questions about the extent to which imitation is involved in creativity reveal an interesting pattern of data—all three statistical effects are significant. Overall, participants believe that imitation was more involved in creativity from pre- to post-survey ($F(2, 175) = 5.24$, $p = .02$, $\eta^2_p = .029$) and Art major participants in particular believe that imitation was involved in creativity ($F(2, 178) = 3.19$, $p = .04$, $\eta^2p = .035$). There is also a significant interaction such that participants with Arts and STEM majors believe that imitation is more involved in creativity from pre- to post-survey and participants with Social

Science majors believe imitation is less involved from pre- to post-survey ($F(2, 178) = 3.68$, $p = .03$, $\eta^2_p = .040$).

Interestingly, imitation in the context of the AiR Ali Hval's work was clearly present when the Graphic Design/Studio Art Club leadership planned and executed an "Ali Hval Day," where students engaged in creative behaviors reminiscent of the Artist-in-Residence's work. Specifically, in March one of the co-authors saw those twenty students, who were engaged with the AiR, gathering on Friday nights to make clay sculptures in the style of the AiR Ali Hval. In an email communication months later, a student explained that the executive team of the AIGA local chapter organized four events over one month, where the AiR work was presented and then displayed on the walls, while students made ceramics work, some inspired by the AiR and some influenced by their own style. The student, a studio art major, felt that the visit of the AiR had an influence in their artistic direction (email communication to NEA grant PI and co-author, July 4, 2023). A largely student-run event series inspired by an AiR demonstrates the program's ability to nurture creative intentions extending several months following the actual AiR visit on campus. Differently than the AiR program, which is led by faculty, the AIGA event was conceptualized and run by students, thus empowering participants to take ownership of their involvement. The sustained interactions during the AiR program with Ali Hval created experiences for further personal growth: the students' choice of displaying her art throughout the duration of an event following the AiR program provided additional sources of inspiration and encouragement for participants. The AiR program's ability to create a supportive artistic community, to provide opportunities for direct engagement, and to inspire personal and artistic growth underscores its significant impact on students' university experience.

Professional Behaviors among Arts Majors

Within the Arts major condition, it is also possible to examine the myriad effects of participating in AiR programming. In the current sample, approximately 69% of individuals in the Arts Condition ($n = 34$) attended at least one Artist-in-Residence event compared to 3% and 7% of students in the Social Sciences and STEM majors respectively. The Artist-in-resident events individuals could have attended included an artist lecture, open-studio hours and a final gallery show and reception. On average, students participated in over 4 events ($M = 4.47$, $SD = 2.78$).

For those individuals that attended AiR events, it was also possible to determine how this engagement affected the students' professional development. We identified multiple professional behaviors that could be influenced by AiR interactions, including finding inspiration, identifying funding opportunities, teamwork, and leadership among others.

Out of the nine professional behaviors and processes we asked participants about, participants who interacted with the AiR reported some benefits and found the greatest help with tolerating ambiguity—specifically understanding that it is "okay" to not know the end product when beginning a piece. This aligns with the aforementioned findings of Guo, Gonzales, and Dilley (2016), which highlight the importance of creative thinking in developing effective leadership skills necessary for navigating uncertainty. Respondents also reported gaining the most in terms of understanding how to explain creative work to others, finding inspiration through new

experiences, and understanding how to create artwork that makes difficult topics accessible to the general public (TABLE 1).

Table 1
How the AiR "helped"

Of the professional development skills below, how did the AiR help you?	*Mean*	*SD*
Ambiguity	5.59	1.12
Understanding how to explain your own creative work	5.41	1.12
Finding inspiration through new experiences	5.39	1.14
Making difficult topics accessible to the general public	5.27	1.27
Process to create a gallery show	4.93	1.27
Presentation style	4.77	1.11
Identifying funding opportunities to support your work	4.68	1.25
Participating in funded competitions	4.32	1.46
Professional attire	4.00	1.50

Note. Participants responded on a scale from 1 (not at all helpful) to 7 (extremely helpful).

Discussion

Limitations

The results from the BICB instrument, which endorses a wide range of creative behaviors beyond artmaking, indicate no statistically significant changes over time in students' self-reported identification of creative behaviors after interacting with the AiR, although art students endorsed more creative behaviors. The survey designed by our research team using principles guided by the Theory of Planned Behavior reveals that art majors have significantly greater intention, feel significantly more pressure, and have more positive attitude towards engaging in creative behaviors, while non-art majors are far less motivated to interact with the AiR. Participation of STEM and social science majors – the control group – to AiR-related events and interactions was negligible.

Although our team's original intent was to capture creative behaviors of students from the creative and design disciplines, from the sciences, and from the social sciences, the students who got engaged the most were from the creative arts including studio art and graphic design. One of the reasons for this limitation could be the physical proximity on campus: the AiR artist had an allocated space for work and open hours at the Ritz Gallery in Grove Hall, the building that hosts the creative arts. There seems to be a correlation between physical proximity and engagement: besides discipline affinity, students in the creative arts had the distinctive advantage of seeing the artist's open door every day moving from one studio class to another and had plenty of opportunities for informal interactions that were not limited to structured events but extended to everyday encounters, in all likelihood nurturing students' desire to be engaged in creative endeavors culminating with the student-led AIGA event several months later. The open-door policy of the AiR and the continuous presence in the creative arts building provided students with ample opportunities for engagement. These interactions were not merely transactional but contributed to the students' personal and artistic growth. The data suggests that students in the

creative arts, who had more frequent and spontaneous interactions with the AiR, were more engaged and motivated to pursue creative behaviors. This highlights the importance of sustained engagement in fostering a deeper connection to the creative process and personal development.

Students from the other majors had their classes farther away from the AiR working space; therefore, their interactions with the AiR were less spontaneously occurring and had to be proactively sought. The AiR program embraced diversity by involving students from various STEAM disciplines, although the resulting engagement was higher among art majors.

Potential Future Direction

In future studies, it would be interesting to observe what happens if the AiR is allocated a working space in closer proximity to disciplines other than studio art and graphic design: for instance, whether a hypothetical allocation of the AiR in the architecture building would increase interactions from architecture students, and so on. Allocating AiR working spaces closer to other academic buildings could potentially enhance interactions and engagement from a broader student population. A follow-up study of this kind would help find out whether physical proximity or having a similar background in the creative arts (which includes students in the studio art and graphic design majors) plays a major role in student engagement with AiR. The data seems to speculatively suggest that most of the undergraduate students may not yet understand the significance of engagements outside of their discipline area for their professional career development; exception is made for art students, who led initiatives continuing beyond the AiR period. Future studies could further examine the reasons behind the observed discrepancy in the number of interactions with the AiR between art students and students from the STEM and social sciences, by identifying whether proximity of the AiR open studio space to their classes plays a role in engagement. Understanding the factors that influence student engagement with the AiR program will be crucial for designing initiatives that promote creative behaviors and enrich the university experience for all students.

Conclusion

In conclusion, this study highlights the evolving definitions of creativity and the importance of integrating arts and AiR programs into educational settings. The findings suggest that physical proximity and discipline affinity significantly influence student engagement with AiR programs. Art majors showed greater intention and positive attitudes towards creative behaviors, while non-art majors were less motivated. Future research should explore strategies to enhance engagement across diverse disciplines, such as reallocating AiR working spaces to be closer to other academic buildings. This approach could foster a more holistic and creative educational experience for all students, ultimately supporting their personal and professional development. Understanding these dynamics will be crucial for designing effective campus initiatives that promote creative behaviors and enrich the university experience.

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