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# Project-Based Learning Influence on Self-Awareness of High School Students

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**Abstract:** To prepare students for the jobs and careers of tomorrow, different skills are needed to be taught in the K-12 setting. Students need to know how to make better decisions, manage achievement related stress, and ultimately, establish purposeful self-advocacy. Higher order thinking skills that academics promote rarely overlap with the domain of building self-knowledge. In fact, in today's academic environment, the effort to imbibe self-awareness practices in our classrooms are often met with fear, frustration and pushback. This study will focus on the overlap of learning and building self-knowledge. This study is based on a project-based learning program called Orbis. The Orbis Program is in the Ankeny Community School District in Ankeny, Iowa, and offers elective courses designed to engage teams of students from several area high schools. In partnership with the workforce, the program aims to solve real problems and improve the local and global community. The mission statement of Orbis is to "Unleash passion. Realize potential. Impact the world." Skills specifically focused throughout the program include leadership, problem-solving and collaboration. Student experiences are grounded leadership, problem-solving, and communication skills. Authentic problems lead to project ideas, and students' passions are matched to projects. Because students' passions direct their project work and learning, no two students have the same Orbis experience. All students have some common experiences, and yet each student has an individualized, personalized experience in which they have an active voice in designing. Project-based learning programs are frequently being expanded in many K-12 schools. Many programs are developed to provide students opportunities to enhance 21st century skills. 21st century skills comprise skills, abilities, and learning dispositions that have been identified as being required for success in society and workplaces. These skills can be defined as collaboration, critical thinking, problem-solving and others. The secondary students in the project-based program in this study got partnered with other students to engage in real-world problems that are presented from the local community or initiated by the students themselves. The results from the study show overall growth in self-direction, role awareness and self-belief from participation in the program.

**Keywords:** Project-Based Learning, Competency-Based Learning, Self-Direction, Role-Awareness, Self-Belief, Self-Awareness, Pedagogy, Confidence

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## 1. Purpose of the Study

There exists a surprising gap between the science and the art of classroom practices that can effectively and

consistently foster self-awareness in students [13]. This is especially challenging in public education settings where teachers are not always afforded the opportunity to get to know their students on a personal level. This study evaluated the influence of a project-based learning

experience on students' self-awareness. Klamfoth [13] asserts:

Conventional wisdom affirms that a highly cultivated self-awareness can be an effective tool to enable learners to make better decisions, manage achievement related stress, and ultimately, establish purposeful self-advocacy. However, the higher order thinking skills that academics promote rarely overlap with the domain of building self-knowledge. In fact, in today's academic environment, the effort to imbibe self-awareness practices in our classrooms are often met with fear, frustration, and pushback.

Creating an opportunity for students to increase their self-awareness, specifically self-belief, role-awareness and self-direction, can be measured through administering an Advanced Insights profile created by Innermetrix [17]. The section of the profile used to provide data regarding an individual's self-belief, role-awareness and self-direction is called the Attributes Index Internal Scale (Appendix A). The Attributes Index will provide data to educate an individual on their self-belief, role-awareness and self-direction; ultimately resulting in a deeper understanding of self-awareness, which is impacted by experiences [21].

Because of engagement in Orbis, students increase their understanding of future direction; that is, where they are going and the value they add. With this self-awareness, self-direction, and role awareness in oneself measured by the ADVanced Insights profile, students are more intentional about how they choose to behave and are therefore successful in relationships with peers and adults, solving authentic problems, and actively engaging as a member of a project team. This change will contribute to their future readiness as they prepare for success after high school. The goal is increased college and career readiness.

This study will focus on the attributes data generated by participants answering the Attributes Index Internal Scale. Attributes are defined by the Results Group [21] as how one perceives the world and is described as external (perception of outside world) and internal (perception of self). The focus will be on the "internal attributes" based on the impact of one's experiences and how they see themselves fitting in the world around them. For participants, this could include experiences such as choosing friends, the choice to participate in school or non-school sponsored activities, how popular they are or to attend college or pursue a career after high school.

To best understand the three internal attributes of self-direction, role awareness and self-belief, an understanding of internal attributes must first be obtained. Appendix B (Score Interpretation Tables) further conveys descriptions for each internal attributes. Internal attributes are best described as a person's reflection of self-awareness [21] regardless of environment or external influence. By focusing this study around the internal attributes and their influence, it will help to understand the impact of students understanding of themselves and the effect it has on their understanding self-belief, role awareness and self-direction.

The researchers predict their internal scores will have

changed (role awareness, self-direction, belief in oneself). This change will be evident in the third component (Attributes Index-Internal Scale) of their individual profiles, showcasing in what order a person thinks and processes.

## 2. Overview of Orbis

The Orbis Program is located in the Ankeny Community School District in Ankeny, Iowa, and offers elective courses designed to engage teams of students from several area high schools. In partnership with the workforce, the program aims to solve real problems and improve the local and global community. The mission statement of Orbis is to "Unleash passion. Realize potential. Impact the world." Skills specifically focused throughout the program include leadership, problem-solving and collaboration.

Student experiences are grounded leadership, problem-solving, and communication skills. Authentic problems lead to project ideas, and students' passions are matched to projects. Because students' passions direct their project work and learning, no two students have the same Orbis experience. All students have some common experiences, and yet each student has an individualized, personalized experience in which they have an active voice in designing. Four guiding principles of the program include:

1. Co-design your learning.
2. Engage in authentic project work with the workforce.
3. Collaborate with the workforce and peers from multiple high schools.
4. Be empowered as a young professional.

### 2.1. Literature Review

Axiology can be defined by the philosophical study of goodness, or value. Axiology is sometimes called Theory of Value [8]. The most fundamental presuppositions of axiological science are that human personalities and behaviors are structured around human values, that values are the keys to our personalities and that by measuring values we can gain powerful insights into who people are and what they are likely to do [15].

The Hartman Value Inventory (HVI), which is what the Advanced Insights Inventory was developed from, is a strictly axiological test which measures the person's capacity to value [16]. The test does not intend to measure the energy or drive a person has. The test is not a psychological, but an axiological test.

The Advanced Insights Inventory is a tool that evaluates bias around self-concept which meant, "value to himself in the degree that he fulfills the intention of his self-concept," according to Hartman in his original research. The inventory forces the participant to rank options and the tool helps to identify the intrinsic factors used to rate bias. This may vary depending on whether a person defines himself systemically (self-direction), extrinsically (role awareness), or intrinsically (self-belief). Bias on the inventory is balanced. Certain combinations are "better than others" in viewing how a person values self. When ordering the items on the internal

scale, the participant is placing more importance on valuing self in one of the scales than the other two. Worth can be based on extrinsic factors (external locus of control) or internal factors (internal locus of control).

This inventory is important because the research suggests that when we see ourselves clearly, we are more confident and more creative [9]. This also helps to develop a strong locus of control. We make sounder decisions, build stronger relationships, and communicate more effectively. We're less likely to lie, cheat, and steal [9]. People tend to be better workers and get more promotions when they see themselves more clearly and understand. And we're more-effective leaders with more-satisfied employees and more profitable companies. [9]

Even though most people believe they are self-aware, self-awareness is a truly rare quality. A large-scale investigation revealed many surprising roadblocks, myths, and truths about what self-awareness is and what it takes to improve it. The 2018 research by Eurich suggests there are two types of self-awareness; experience and power hinder self-awareness. Another take-away from the findings is that introspection doesn't always make you more self-aware. Understanding these points can help leaders learn to see themselves more clearly [9].

Daniel Goleman, author of the book *Emotional Intelligence* (2005), describes self-awareness as the "ability to monitor our inner world – our thoughts and feelings." The authors [12] state, "This means having a deep understanding of one's strengths, limitations, values, and motives. People with high self-awareness are honest with themselves about themselves. They are realistic, neither overly self-critical nor excessively optimistic." [13]

Self-awareness is arguably the most crucial academic skill and a building block of self-regulation, which according to Eisenberg et. al [7] is the balancing and management of one's emotions in everyday life. Effective learners successfully guide attention and intention towards the self as a doer, thinker, and an evaluator and help yield academic and social goals set by self for self [13].

Self-awareness has been associated with leadership success involving two components: how people see and assess themselves as well as viewing how one is perceived by others [23]. Those authors defined self-awareness as having two parts: "(1) how people see themselves and the process by which people make assessments about themselves and (2) the ability to detect how they are perceived by others" (p. 658-9).

People all tend to reject negative things we hear in favor of positive ones, even if the negative ones are more accurate. Learning about our blind spots, weaknesses or insecurities is emotionally difficult [1]. To become more self-aware you have to be self-aware enough to realize how self-aware you are not. It's a bootstrapping problem. Unless something happens that forces you to realize how inaccurate your view of yourself is, you can go through life never even knowing who you are. Even with persistence, it is convenient to wait until the "challenging segments" of an

experience arise right where a discovery is available to us and reject it before we risk getting hurt. We are great at inventing logical reasons to cover up or conceal those things of which we are scared of. Fear is twice as powerful when we call it by other names. Self-awareness, the trickiest thing to develop, is a paradox: to become more self-aware, you must be aware enough about yourself to know you need to know yourself better. [1]

Students deserve to be exposed to information about themselves which will create greater depth in self-awareness, specifically in the areas of self-belief, role awareness and self-direction [14, 19] and ultimately result in personal growth [5]. The growth in the areas of self-belief, role awareness and self-direction [19] could be advantageous to students as they make important life decisions [10, 22].

Traditionally, self-awareness is accomplished through environment, events and choices which occur in a student's life [4, 5]. As a student's self-awareness develops, helping a student in understanding who they are becomes increasingly important [24, 6, 20, 22, 18]. The more a student understands themselves the more they may be able to negotiate their options about their education, relationships, career aspirations, and perhaps other important decisions they will make throughout their lives.

## 2.2. Methods

Mixed methods will be utilized throughout this research period: qualitative data from Orbis exit interviews with students (conducted by Dr. Jill Ulrich) and quantitative data from the ADVanced Insights profile assessment (administered by Results Group, LLC). Students will take this electronic assessment on their individual tech devices at the beginning and end of their Orbis experience (pre- and post- data). The adverse impact statement from the use of the tool is outlined on Appendix C.

Anecdotal data will be collected on a google doc shared by the Orbis team (two Project Mentors and Director). Orbis exit interviews will be administered in person, one on one with Dr. Jill Ulrich, and a note-taking method will be used, followed by coding for themes. The questions asked to each student will be framed by the research questions driving the study.

The ADVanced Insights Profile provides a depth of understanding of participants through three different, yet intricately connected profiles: DISC; Values Index and Attributes Index. This study will focus on the Internal Attributes Index. This instrument (Appendix A) was created and owned by Innermetrix Inc. Permission was granted for use by Jay Niblick and Innermetrix International [17]. The ADVanced Insights Profile has been used in the business world very successfully and is also being used at several schools and universities in the Midwest.

Key research questions were developed to guide the study. Interview questions asked to each student during their exit interviews were framed by the research questions driving the study. The research questions include:

1. Does a student's self-direction change due to a project-based learning experience? 2. Does a student's role-awareness change due to a project-based learning experience? 3. Does a student's self-belief change due to a project based learning experience? 4. What factors contribute to a student's change in self-direction, role-awareness or self-belief?

### 2.3. Interviews

Students were asked ten questions during exit interviews. Clarifying questions were asked when necessary to fully understand the student responses. The feedback on these interview questions will help the researchers understand the internal scores on Attribute Index. The questions that were asked during the exit interviews were the following:

1. Now that we've reviewed your pre- and post- Internal scores on your Attribute Index, how do these make sense to you?
2. What's been your experience in Orbis that could lead to these scores?
3. What prevents you from setting boundaries for yourself?
4. How has your view of your role(s) changed over the last few months and throughout your Orbis experience?
5. What has been the direction for your project team from when you first began working together to now? How have you fit into this? What's the team experience been like for you?
6. Now that you understand what these scores mean for you, how do your low scores create difficulties in your (role) (life) (relationships) (ability to lead) (etc.)
7. In your opinion, what would need to change for you to set healthy boundaries for the direction you are headed?
8. For you, what would need to change in order for you to have a clearer understanding of the direction your team is headed?
9. Since knowing your Advanced Insights Profile, how has your understanding of the value you add to your group changed?

Long-term impact data of the study will be collected by Orbis alumni annually each year following high school graduation, for a minimum of five years, through survey data administered by Dr. Jill Urich. This particular survey data collection is outside of the time/scope of this particular research proposal, yet the data is included in the overall Orbis evaluation plan.

### 2.4. Participants

The ADVanced Insights profile will be administered to Orbis students during their first semester of Orbis during the onboarding experience (within the first 2 weeks of the semester) and again at the end of their Orbis experience. These two scores will serve as pre- and post-scores.

Creswell [2] describes a convenient sample as when participants are purposefully chosen based on their availability for the study. Sixty-eight participants qualified for the study. Qualifications included enrollment in the Orbis program, completion of the Advanced Insights Survey and

willingness to participate in an exit interview.

Exit interviews were conducted at the end of students' Orbis experience. Anecdotal data will be collected throughout the school year on individual students' experiences as they pertain to behaviors we predict will show change over time. This data will be collected by the Orbis team (two Project Mentors and Director).

Taking the ADVanced Insights profile assessments and participating in Orbis exit interviews will occur during Orbis class time as components of the Orbis experience for all students enrolled in Orbis. In all data collection for this research project, students' personal information will be removed and replaced with a code system for confidential purposes.

### 2.5. Data Analysis

For this mixed methods study, it is important to use the numbers in a bias-free and meaningful manner; therefore, the epistemology for this study is objectivism. Epistemology is the theory of knowledge that differentiates justified belief from opinions [3].

Data from participants will be analyzed in three ways. First, student scores on self-direction, role awareness and self-belief will be compared from when they entered the Orbis program to when they conducted their exit interview. Researchers will carefully analyze the Advanced Insights Inventory scores looking for trends and outliers. Scores for role awareness, self-direction and self-belief specifically will be analyzed.

In the next phase of the data analysis the researchers will align the narrative exit interview responses from all participants and code their feedback with the research questions that guided the study. The narrative feedback will provide insight to explain the increases in scores for role-awareness, self-direction and practical-thinking.

In the third phase of the data analysis process the researchers will seek to answer each research question by comparing the overall participant scores and justify the change in scores (up or down) with the qualitative feedback. Insights will be shared from both the qualitative and quantitative data that help to explain the findings.

Data from the study will be conveyed in the findings section of the paper with each research question answered directly in the conclusions section.

### 2.6. Limitations

There are few limitations of this study. First, the participants in the study were primarily Caucasian with little diversity represented in our sample. Participants were also from a suburban setting with most of their educational experience all in the same school system. Consequently, the results should be viewed with caution when generalizing to students of color and students who live in more urban settings. The geographic location of the state in which this study was completed has a student population of non-white student of less than 20%.

Another limitation of the study was the length that the students experienced the Orbis program. Some students in this study were new to Orbis in January 2020; therefore, they were only enrolled for two months before schools shut down due to COVID-19. The exit interviews for these students enrolled in second semester occurred after schools had been shut down for two months. Thus, the influence the Orbis program could have on these students was less than other students who experienced the program for one academic year or longer.

This study is a snapshot in time and not a longitudinal study. Since the study focused on self-direction and self-belief the results should be viewed with caution in making determinations about growth of participants. Future research may focus on long-term effects of a project learning program such as Orbis or alumni could be tracked to monitor the long-lasting implications from the program. This study is not organized to collect such data or make such conclusions.

### 3. Findings

Both qualitative and quantitative data will help answer the prescribed research questions. The qualitative data answers came from exit interviews with the participants. While talking about their Orbis experiences, they wove in answers to the questions specific to Advanced Insights profiles. Each student was provided with the questions and invited to share their thinking while telling their story. To that end, students interchanged information about Orbis and Advanced Insights throughout the interview process. Quantitative data was gleaned from the Advanced Insights Inventory.

The following section will convey the findings from the study. Findings will be organized by research questions to ensure the clarity of each answer. All answers to the research questions will be answered based on scores from the ADVanced Insights Profile assessment and student comments.

R1: Does a student's self-direction change due to a project-based learning experience? Twenty six of the sixty-eight participants in the study showed an increase of at least .5 score on the Advanced Insights profile category of self-direction. Furthermore, eight of those same participants showed a change in bias scores around self-direction which means they became clearer on where they are at, where they are going and their path to get there. Overall, the students' self-direction increased throughout their project-based learning experience. This increase in self-direction scores and change in bias is supported by some of the students' feedback during their Orbis exit interviews.

Once students said, "The program changed my view of myself as a young professional with strengths to contribute." They went on to describe how they thought the program developing understanding of themselves would help in college stating, "My Orbis experience has prepared me to be successful with projects in college. For example, I now navigate my time management better, I know how to make

positive connections and relationships with people, and I use LinkedIn."

Some students gained confidence in their own skills and abilities that provided a clearer direction for how they could impact their colleagues and the larger community. One student reported, "I'm surprised at the project my team did and the impact we made. I did not expect to make that large of an impact and actually make a difference in our community, and the leaders from the community who were involved." another student spoke about gaining confidence saying, "I gained confidence in communicating more effectively with others and adapting their language to bring out strengths in others. Through this program I was able to embrace failures, struggles, and uncertainties which made me more confident in my abilities."

"Greater engagement due to personalized experiences and having the autonomy to pursue interests and passions was the biggest factor to my success in Orbis," one student said during their exit interview. This was cooperated by other statements like, "The autonomy to follow your interests and even deciding where your team wants to plant themselves to do their work." and "We're not sitting at desks. We are trusted to work as a team and learn as we go," substantiated the student's appreciation for the program as well as insight to why their self-direction scores grew on the Advanced Insights profile from when they started the program to when they exited. For some students the impact was in two months and for others it was two years.

R2: Does a student's role-awareness change due to a project-based learning experience? Overall, students reported an increase in role-awareness based on the Advanced Insights profile scores and qualitative feedback. Role-awareness is the clarity participants had in their role as a student. Thirty-eight percent (24/68) of participants showed growth on their role-awareness scores from their pre to post scores growing more than .5. And fifteen percent of participants (10/68) had a change in bias on the same profile based on their experience in the Orbis program.

The increase in bias scores relates to the clarity of how they see themselves as a student and person.

Feedback from participants during their exit interviews shed light on the overall increase in role-awareness scores around learning, collaboration and impact. One student said, "I've learned how to find a balance of others' opinions with my own. It doesn't have to be my way or the highway OR allowing others to walk all over me. It's a balance of figuring out what works best, what the best decision is in any given situation." Another stated, "I was surprised at what I learned about my peers who I thought I knew before. In Orbis, I see them differently. I see more depth and dimensions to them because they are young professionals making an impact on our community. And everyone has skills that make all of us better!" Clearly, collaboration between students with a common goal helped students define their roles and build critical 21st Century Skills.

Students went on to say, "I've developed a mindset to work with people who before I would have seen as being

incompatible to me.” And another said, “Communicating effectively with college professors, advocating for myself and pursuing guidance when I need it.” These comments are examples of students confirming how the project-based Orbis program developed their skills to work effectively with others and develop communication skills.

Other 21st Century Skills developed as a student in the program were time management and impact. One young lady shared insights to developing her time management skills because of some of the tools they used in the program like SCRUM and Trello for projects. She said, “Time management and the value of planning was big for me. I thought this was going to be a class where projects are like assignments teachers give you. This was totally different and I learned more by prioritizing my time and working with my team to meet deadlines.” Another Orbis student said something similar highlighting the impact of the program having a greater purpose than just completing a project for the teacher. He said, “Viewing self as a part of a greater purpose, recognizing one’s ability to make an impact on the community was important to me and something I didn’t expect. I valued the authentic project work vs. traditional classroom assignments.” “After our initial onboarding, it surprised me at how supported we are to take an idea and run with it. It’s a safe place to fail early and learn from it and move forward with an idea that makes a real difference.”

R3: Does a student’s self-belief change do to a project based learning experience? Overall, self-belief scores increased (.5 or greater) for 34% (23/68) of the Orbis students who served as participants in the study. Self-belief bias scores also changed for 19% (13/68) students which means they are more confident in being able to achieve their goals. Insights were offered by students about why their scores changed around self-belief. Looking for strengths in each other seemed to be one aspect of what the students learned which influenced their self-belief. One person shared, “Utilizing an agile approach vs. being locked into linear thinking allowed us to build on each other’s skills and address challenges how we felt best. We didn’t always get them right the first time, but we didn’t quit until we had a solution.” Another student shared a similar point, saying, “Seeking strengths in others to learn and grow (peers, workforce experts, project mentors as coaches) was a value to me. I know if I didn’t have the answers I could turn to others who did.”

Developing leadership skills and the mindset to lead was also a theme that emerged from the data. “I now believe that everyone can be a leader, and that leaders exist formally and informally,” one participant said. Another, “What surprised me... that it wasn’t a class. And how easy it was to connect with others and build relationships.” The influence wasn’t just limited to the Orbis program either, feedback from students provided insight to how their relationships changed back in the traditional school setting and at their job. One student said, “What surprised me is how close you can become with fellow team members. You get to know students in a different way. Becoming friends with students

from other high schools was something I didn’t expect to have happen in Orbis. And now I see students in Orbis who are in my high school - I see them in a different light now. They have more depth to their interests than what I saw before.” Another spoke to how it changed their confidence and willingness to take on challenges at their job, stating, “At my job currently, I am now more professional, I am more confident in talking to my boss- I used to be intimidated to talk to him, and I’m more prepared for future interviews. Also, I look at every situation differently now. I enjoy looking at situations and using problem-solving skills and reworking problems to find a better solution.”

Gaining collaboration and communication skills was also a theme in developing self-belief in the Orbis program. Multiple participants address their growth in these areas in different ways. One said, “Collaboration skills, definitely. I know how to communicate better and I’m more confident, even talking with people I don’t know very well.” Another said, “Definitely communication (was an area I grew). I have changed a lot since my first project at the beginning of Orbis. I’m now not afraid to seek out help, to be more social, and I feel more confident. I don’t think twice about seeking out wisdom from other people whether it is a student on my project team or an adult expert.”

R4: What factors contribute to student’s change in self-direction, role-awareness or self-belief? Forty-six out of sixty eight (68%) of participants increased .5 or more in at least one of the profile areas of self-direction, role awareness or self-belief. This is the majority of participants that showed considerable growth from the project-based experiences in the Orbis program. Furthermore, twenty-four of the forty-six students (52%) who grew in self-awareness areas grew on one scale, eleven of the twenty-four participants (46%) grew in two or more scales, and another eleven of the twenty four (46%) grew on all three scales.

Various factors seem to contribute to students’ overall growth in the self-awareness areas of self-direction, role awareness and self-belief as measured on the Advanced Insights profile. Participants offered various reasons during their exit interviews worth noting. Some of the overall themes included appreciation for the program, autonomy in learning, authentic learning opportunities and the environment of the program that fostered collaboration.

Participants sounded appreciation for the program during their exit interviews in multiple ways. One student said, “The freedom we feel coming here- freedom of being treated like an adult. As seniors, it’s easy to get senioritis, and Orbis keeps us interested in coming to school, keeps us engaged in our learning, and we’re motivated by the impact our work makes for the community versus turning in an assignment.” Another stated, “I love how Orbis is about people coming together - all people - students from different high schools, community, business leaders, Project Mentors. It’s about all of us coming together and making an impact together, doing something extraordinary. And it’s all because we decided to collaborate and work together.” More than one student suggested the Orbis program was the favorite part of the day.

A participant finished their interview emotional saying, “Orbis was my favorite class, one that has inspired me more than any other.”

Autonomy in learning was another theme that emerged from participant interviews which attributed to their changes in self-awareness. Multiple students suggested that having to self-regulate their responsibilities to complete a project was valuable. One specifically said, “It’s helped me develop confidence, professional skills, time management, and skills in communicating with adults.” Another went on to address the human-centered design approach which was the framework for their project stating, “I really gained a lot by empathizing with end-users in mind, using the human-centered approach of Design Thinking was helpful to me throughout the program.

Having authentic learning opportunities was also a general theme that emerged from the study that contributed to gains in self-direction, role-awareness or self-belief. Comments stated, “Orbis is a really fun way to learn what I need to know to set me up for success after high school because the projects were real.” And another said, “I’ve learned about how to have relationships with people in the workforce and I’ve learned a lot about different businesses and organizations.” Clearly, students working on a real-world project with community partners was an aspect to their growth in self-awareness. Many will be better college students and employees because of the training and experiences in the project-based Orbis program. One student even said during their exit interview, “I’m readier to enter life after high school. I feel like I won’t flop because of the skills I learned, such as how to collaborate with others and how to manage my time. It’s not a school feeling, and yet I’m doing work - important work, and yet not feeling overwhelmed. I’m treated like a young adult, and I feel more confident when I’m here. Orbis has taught me how to communicate better, and this will definitely help me in my future work as a marine. I am more equipped on how to read others.”

Participants shared other comments during their interviews validating the program and providing insights around growth in their own self-awareness on self-direction, role awareness, and self-belief. Although they don’t always use the same vocabulary, the statements they make frequently conveyed new levels of understanding about themselves, how they learn best, and how they learned to work with others (adults and peers). A student complimented the program staying, “Orbis is a great program for high school students. All students should take Orbis because what we learn here is so different from other classes. At first, I would say if you don’t like working with others, then Orbis is not for you. BUT, Orbis is probably good for you if you don’t like working with others because we all need to know how to collaborate no matter what career we go into.” Another confirmed the value of students who are open-minded to project-based learning offering how best to share the program with other students, saying, “Communicate to potential Orbis students: If you are not open-minded and if you don’t want to grow, Orbis is not

for you.” She finished by saying, “I love Orbis. I wish I would have taken it last year.”

## 4. Conclusions

The researchers predicted a change in internal scores (role awareness, self-direction, self-belief) with students based on their experience in the Orbis program and understanding of their ADVanced Insights Profiles. The findings are due to the participants results on the profile and then applied as they participated in Orbis program. This includes benefits from the structure and activities they also experienced in Orbis. The results from this study confirm that self-awareness, self-direction, and self-belief gained from the ADVanced Insights profile, students are more intentional about how they choose to behave and are therefore successful in relationships with peers and adults, producing project work, and actively engaging as a member of a project team. This change will contribute to their future readiness as they prepare for success after high school and life in general.

Although this study is another toward understanding how to develop self-awareness in students, there are various opportunities for future research. One area worth further exploring is around equity and inclusion. It would be interesting to study the degree to which Orbis breaks down equity barriers and creates an environment valuing diversity and inclusion. This is important for every school to consider and perhaps a more intentional focus on self-direction, self-belief and role awareness could help build understanding about equity and inclusion.

Another area for future research would be to use the initial findings of this study and produce a longitudinal study tracking alumni. Tracking students over a longer period of time could identify other impacts around self-direction, self-belief and role awareness.

This study illuminates the importance of helping students understand themselves better. Although the focus of this study was specific to self-direction, self-belief and role awareness, it demonstrates that programs such as Orbis can play a significant role in developing awareness in students. The awareness students learn about themselves was found to have a meaningful impact on their academic and personal well-being and may also benefit them after graduation.

## Appendix

### *Appendix A: Attributes Index Internal Scale*

Over fifty years of scientific research has revealed that there are three distinct styles of decision-making. Each of us can make decisions in these three ways, but we tend to develop a preference for one more than the other two. This preference becomes a subconscious force, affecting the decisions we make on a daily basis and shaping how we perceive the world around us, including ourselves. This preference can be applied in two realms, ourselves (internally) or anything other than ourselves (externally).

When applied internally, these three dimensions can be thought of as self-concept (i.e., Systemic valuation), self-application (i.e., Extrinsic valuation) self-belief (i.e., Intrinsic valuation).

*The Self-Concept dimension:* This is the dimension of systemic definition, "What am I?" It involves the qualities and properties that define you. Examples would be; human, student, employee, citizen, friend, etc. It does not deal with the quality or degree to which you fulfill those definitions, simply what those properties are to begin with. This perspective on yourself is black & white. Either you have the properties to be defined as a student (e.g., you are enrolled in formal schooling), or you do not. It serves as the basis, upon which, subsequent dimensions build.

*The Self-Application dimension:* This is the dimension of extrinsic definition, "How am I?" It builds upon the systemic definition of the self-concept to incorporate comparative judgments of goodness or badness with regard to how well you feel you meet the definition of a thing. If the systemic dimension defines what something is supposed to be (e.g., "a good student takes classes, studies hard and gets good grades"), this extrinsic dimension qualifies how well you feel that you meet those definitions (e.g., "I attended 'most' of my

classes, applied myself relatively well and made moderate versus excellent grades").

*The Self-Belief dimension:* This is the dimension of intrinsic definition, "Who am I?" It involves valuing yourself as unique and special and your individuality. In an ideal sense, it is separate from the other two dimensions. An intrinsic self-valuation is based on what special properties you possess that make you valuable, outside of a connection to systemic and extrinsic definitions (e.g., "Regardless of whether I'm a good student, star athlete or attractive person, I am still infinitely valuable and worthy"). This dimension could be described as self-love or self-worth - that is independent of the other ways in which you might value yourself.

Thanks,

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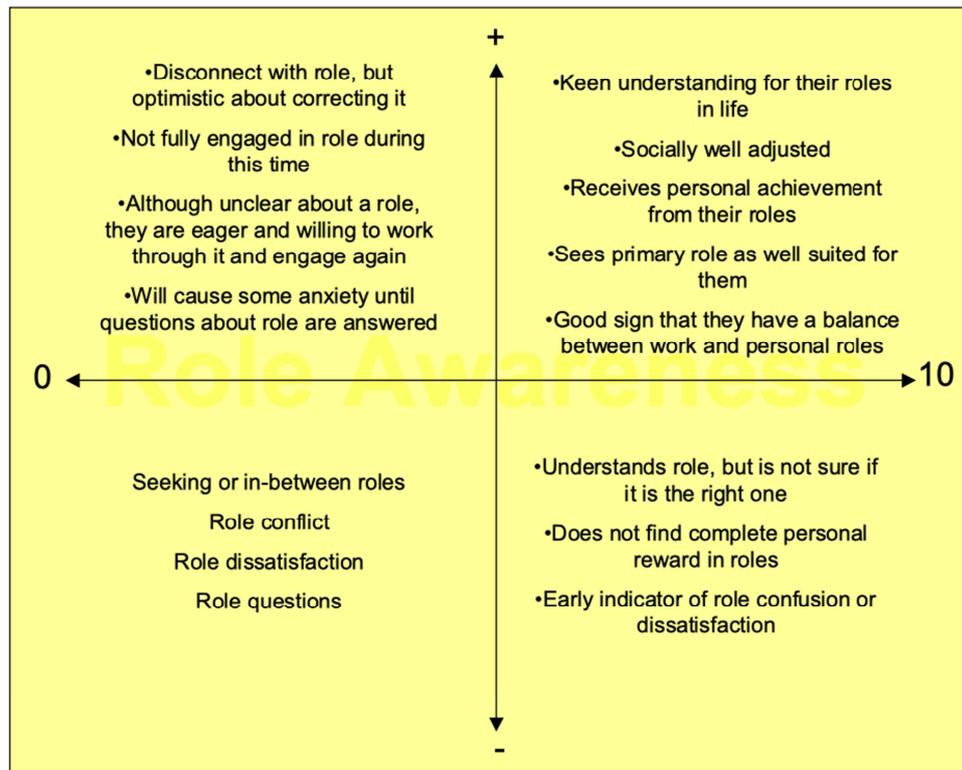
The Profitable Consultant (Foreword by Marshall Goldsmith)

What's Your Genius (Foreword by Tony Robbins)

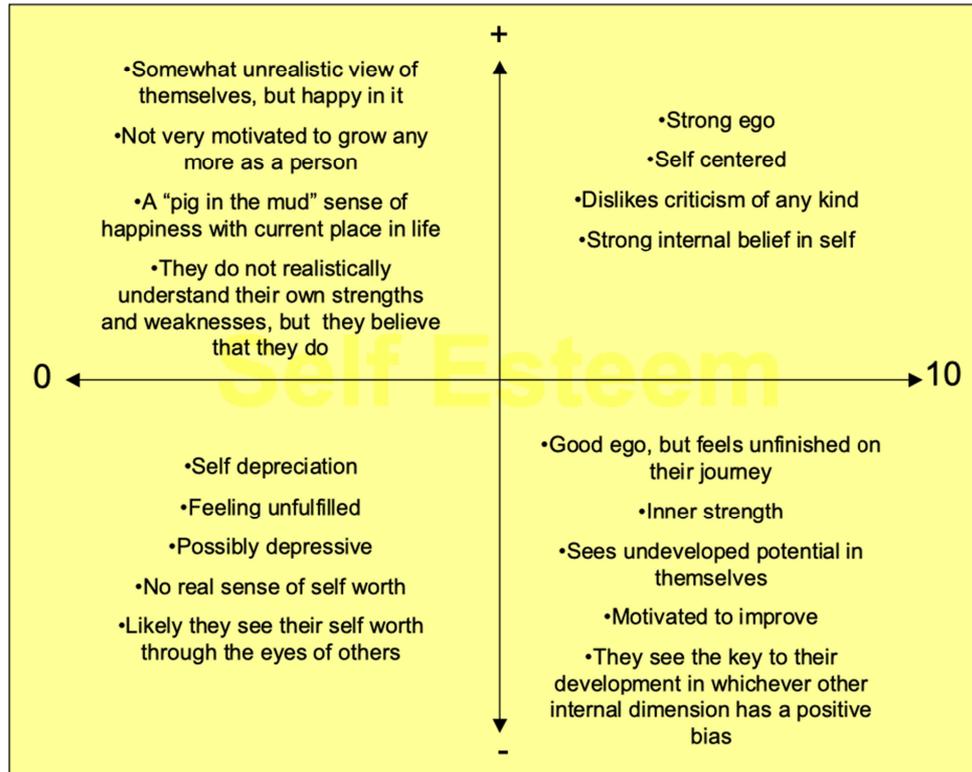
*LinkedIn Profile*

**Appendix B: Score Interpretation Tables**

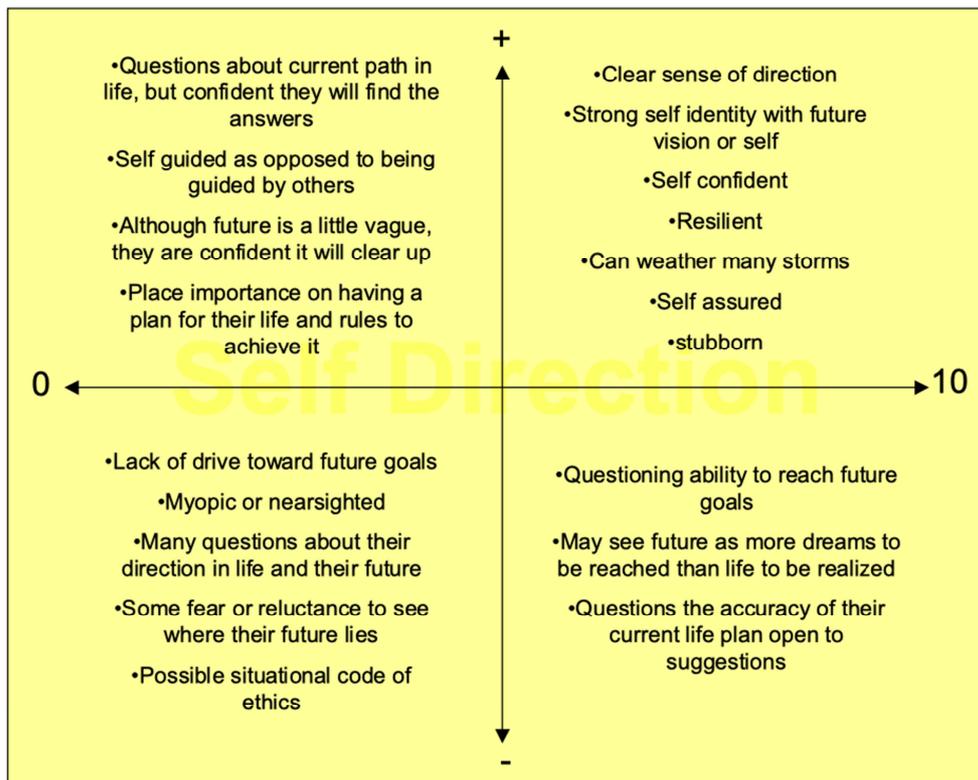
**Role Awareness**



## Self Esteem



## Self Direction



## Appendix C: Adverse Impact Findings



### INNERMETRIX INCORPORATED ADVERSE IMPACT STUDY FINDINGS

#### What is Adverse Impact?

As defined by both the U.S. Department of Labor Employment and Training Administration (*Testing and Assessment: An Employer's Guide to Good Practices - 1999*), and the Equal Employment Opportunity Commission's *Guidelines on Employee Selection Procedures - 1978*, Adverse Impact, or Disparate Treatment, is defined as:

*A substantially different rate of selection in hiring, promotion or other employment decision, which works to the disadvantage of members of a race, sex or ethnic group.*

Title VII of the Civil Rights Act of 1964 (henceforth referred to as Title VII) prohibits employment discrimination on the basis of race, color, religion, sex, or national origin. The Equal Employment Opportunity Commission (EEOC) is the federal agency responsible for enforcement of Title VII. In 1978, the EEOC, along with the former Civil Service Commission (succeeded by the Merit System Protection Board and the United States Office of Personnel Management), the United States Department of Labor, and the United States Department of Justice established the Uniform Guidelines on Employee Selection Procedures and the Uniform Employee Selection Guidelines Interpretation and Clarification. These documents are more conveniently referred to as the *Uniform Guidelines*. The Uniform Guidelines serve as a set of guidelines to follow for ensuring compliance with Title VII.

The Uniform Guidelines apply to essentially all organizations that employ 15 or more employees. Due to a number of complex factors, adverse impact is extremely prevalent in tests or other types of procedures that are used for making employment decisions. Although the Uniform Guidelines and adverse impact are most frequently discussed with respect to testing and hiring employees, they apply to virtually any employment decision that impacts one's job standing. They also cover contractors and subcontractors to the federal government and organizations receiving federal assistance.

Although Title VII permits claims of discrimination based on race, color, religion, sex, or national origin based on either disparate (adverse) impact or disparate treatment, Title VII does not apply directly to discrimination based on age or disability. Rather, the Age Discrimination in Employment Act and the Americans with Disabilities Act of 1990 protects those ages 40 years old and above and disabled individuals, respectively. Historically, the Age Discrimination in Employment Act only permitted claims of age discrimination based on disparate treatment. However, in *Smith v. City of Jackson* (544 U.S. 228, 2005) the U.S. Supreme Court allowed for charges of discrimination based on disparate impact. It is likely that adverse impact will play an increasingly important role in age discrimination charges and cases in the future.

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## References

- [1] Burkin, S. (2012). Can self-awareness be taught? Blog Oct. 11, 2012.
- [2] Creswell, J. W. (2013). *Research design: qualitative, quantitative, and mixed methods Approaches* (4th ed.). Thousand Oaks, CA: Sage Publications.
- [3] Crotty, M. (2003). *The foundations of social research: Meaning and perspective in the research process*. Thousand Oaks, CA: Sage Publications.
- [4] Coomes, M., & DeBard, R. (2004). A generational approach to understanding students. *New Directions for Student Services Journal*. Wiley Online Library. <https://doi.org/10.1002/ss.121>
- [5] Dworkin, J. B., Larson, R., & Hansen, D. (2003). Adolescents' accounts of growth experiences in youth activities. *Journal of youth and adolescence*, 32 (1), 17-26.
- [6] Eccles, J. S., Barber, B. L., Stone, M., & Hunt, J. (2003). Extracurricular activities and adolescent development. *Journal of social issues*, 59 (4), 865-889.
- [7] Eisenberg, N., Spinrad, T. & Eggum, N. (2010). Emotion-Related Self-Regulation and Its Relation to Children's Maladjustment. *Annual Review of Clinical Psychology* 2010 6: 1.
- [8] Encyclopedia Britannica. (2019). The world standard in knowledge since 1768. Retrieved from <https://www.britannica.com/>
- [9] Eurich, T. (2018). What is self-awareness and how to cultivate it. *Harvard Business Review*.
- [10] Fredricks, J. A., & Eccles, J. S. (2006). Extracurricular involvement and adolescent adjustment: Impact of duration, number of activities, and breadth of participation. *Applied developmental science*, 10 (3), 132-146.
- [11] Goleman, D. (2005). *Emotional Intelligence: Why it can matter more than IQ*. Bantam Books.

- [12] Goleman, D., Boyatzio, R. & Mckee, A. (2002). The Emotional Reality of Teams. *Journal of Organizational Excellence*. 21: 2. <https://doi.org/10.1002/npr.10020>
- [13] Klamath, S. (2019). Cultivating self-awareness to move learning forward. *Education Dive Blog*. October 22, 2019.
- [14] Hamachek, D. (2000). Dynamics of self-understanding and self-knowledge: Acquisition, advantages, and relation to emotional intelligence. *The Journal of Humanistic Counseling, Education and Development*, 38 (4), 230-242.
- [15] Hartman, R. S. (1967). Formal Axiology and the measurement of values. *The Journal of Value Inquiry*, 1 (1), 38.
- [16] Hartman, R. S. (2011). *The structure of value: Foundations of scientific axiology*. Wipf and Stock Publishers.
- [17] Innermetrix Incorporated Adverse Impact Study Findings (2014). *Knoxville, TN*.
- [18] Mahoney, J. L., Cairns, B. D., & Farmer, T. W. (2003). Promoting interpersonal competence and educational success through extracurricular activity participation. *Journal of educational psychology*, 95 (2), 409.
- [19] Niblick, J. (2004). *What's your Genius: How the best think for success in the new economy*. Ronkonkoma, NY: St. James.
- [20] Niblick, J. (2009). *What's your Genius: How the best think for success in the new economy*. Ronkonkoma, NY: St. James.
- [21] Results Group (2019). *Training Materials*. Retrieved from <https://resultsgroup.com>
- [22] Siegel, D. J., & Hartzell, M. (2013). *Parenting from the inside out: How a deeper self-understanding can help you raise children who thrive*. Penguin.
- [23] Sturm, R., Taylor, S., Atwater, L. & Braddy, P. (2013). Leader self-awareness: An examination and implications of women's under prediction. *Journal of Organization Behavior*. 35 (5). <https://doi.org/10.1002/job.1915>
- [24] Zimmerman, B. J. (2000). Self-efficacy: An essential motive to learn. *Contemporary educational psychology*, 25 (1), 82-91.