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Investigation into Students' Perception of Industrial Design as a Prospective Career

Öğrencilerin Endüstriyel Tasarımı Aday Kariyer Olarak Algılamalarının İncelenmesi

Peter Oluwagbenga ODEWOLE[a], Ebenezer ODJİ[b], Blessing ARİO[c]

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ABSTRACT
Students' perception of a discipline determines their career choice in that respect. Despite that the curriculum of the Industrial design field encourages the development of creative skills most needed in the era of advanced and fast-paced technological development, students' lack of adequate knowledge of what the Industrial design discipline entails can largely discourage them from choosing the discipline as their prospective career. Therefore, this study investigates students' career perception of Industrial Design as it is offered in Nigerian tertiary institutions concerning career awareness, the consciousness of inherent creative skills, gender suitability, and financial prospect. A survey was conducted and responses were elicited from 500 respondents, comprising secondary school students within Southwestern Nigeria. Based on the results of the finding, recommendations were provided to stakeholders in the field of Industrial Design on ways to promote the discipline in the country, given its immense potentialities for job creation and poverty alleviation.

Keywords in Turkish:
Endüstriyel tasarım, ortaokul öğrencileri, kariyer algısı, Hollanda'nın kariyer seçimi teorisi.

ÖZ
Öğrencilerin bir disipline ilişkin algıları, bu açıdan kariyer seçimlerini belirler. Endüstriyel tasarım alanı müfredatının, ileri ve hızlı teknolojik gelişme çağında en çok ihtiyaç duyulan yaratıcı becerilerin gelişimini teşvik etmesine rağmen, öğrencilerin Endüstriyel tasarım disiplininin neleri gerektirdiğine dair yeterli bilgi eksikliği, onları muhtemel kariyerleri olarak disiplini seçmekten büyük ölçüde caydırabilir. Bu nedenle, bu çalışma, öğrencilerin kariyer farkındalığı, doğuştan gelen yaratıcı becerilerin bilinci, cinsiyet uygunluğu ve finansal beklenti ile ilgili olarak Nijerya yükseköğretim kurumlarında sunulan Endüstriyel Tasarım hakkındaki kariyer algılarını araştırmaktadır. Bir anket yapıldı ve Güneybatı Nijerya'daki ortaokul öğrencilerinden oluşan 500 katılımcıdan yanıtlar alındı. Bulgu sonuçlarına dayanarak, istihdam yaratma ve yoksulluğun azaltılması için muazzam potansiyelleri göz önüne alındığında, ülkede disiplini teşvik etmenin yolları hakkında Endüstriyel Tasarım alanındaki paydaşlara önerilerde bulunuldu.

[a] Peter Oluwagbenga ODEWOLE, Olabisi Onabanjo University College of Engineering and Environmental Technology, peterodewole@gmail.com, https://orcid.org/0000-0002-0977-2993
[b] Ebenezer ODJİ, Olabisi Onabanjo University College of Engineering and Environmental Technology, ezerodjimin@gmail.com, https://orcid.org/0000-0003-1929-6385
[c] Blessing ARİO, Olabisi Onabanjo University College of Engineering and Environmental Technology, blessingario11@gmail.com, https://orcid.org/0000-0002-6326-9590

Introduction

Career also referred to as career path, job, vocation, occupation or profession is an aspect of a person's life that is concerned with employment, that is, what a person does to earn a living. Career choice refers to the selection of a particular career path. Perception is defined as the process by which organisms interpret and organize sensation to produce a meaningful experience of the world (Pickens, 2005). Therefore, career perceptions are fundamentally formed from the images young people receive (Fosket & Hemsley-Brown, 1999). Career choice is a complex decision given that it determines either positive or detrimental psychological, physical and socio-economic future life (Akosah-Twumasi, Emeto, Lindsay, Tsey & Malau-Aduli, 2018). Since career decision is a paramount step that every student must make in preparation for the tertiary level of education, students' career perception goes a long way to determine their career decision as it can either encourage or discourage their decision and choice of a particular career path. Therefore, an understanding of how young people make decisions about careers as well as how that affects and interacts with their choice of higher education pathways is a critically important issue (Fosket & Hemsley-Brown, 1999).

In Nigeria, just like in many other developing countries, secondary school students engaging in career decision-making often encounter significant challenges due to different social and economic conditions (Odji & Rahman, 2020). This could be because developing countries tend to direct their students into careers according to their country's perceived needs (Kazi & Akhlaq, 2017). Due to the increasing rate of unemployment in Nigeria after graduation from tertiary institutions, emphasis has been laid on the teaching and learning of vocational and entrepreneurial-related courses for all the students in tertiary institutions irrespective of their career path (Nwite, 2016). The reason behind this, according to Odewole (2016), is that vocational and entrepreneurial-related courses. For instance, Industrial design has a huge potentiality to guarantee job opportunities after graduation. If this is true, the question that readily comes to mind is: why does Industrial Design programme often have low students' enrolment in various tertiary institutions where it is offered as an academic discipline in Nigeria? To find an appropriate answer to this question, this study investigates the perception of secondary school students with respect to their awareness of the discipline, their level of required inherent creative skills as well as financial prospect, nature and gender suitability of the discipline as factors that can either trigger or discourage their choice of Industrial Design as a prospective career.

Literature Review

Concept and Prospect of Industrial Design

Industrial design is regarded as a synergy between applied art and science targeted at creating and developing aesthetic, ergonomic, and functional products (Kashim, 2013). Industrial design is relevant to a wide variety of products of industry and handicrafts products ranging from household products such as toys and furniture to luxury products such as watches and jewelry to utility products such as medical instruments, electrical appliances, cars, architectural structures, sports equipment, including textile design, packaging, customization and branding of products among others (World Intellectual Property Organization WIPO, 2011). The concept of industrial design is interdisciplinary with the option of ceramics, textiles, and graphics as areas of specialization in Nigerian tertiary institutions (Akintayo & Abiodun, 2013). Kashim (2013) reveals the role of industrial design in promoting Nigerian's rich visual and material culture. The significance of design thinking

which is one of the major skills taught in Industrial design (a domain of design education) towards achieving the technological development of the first, second and third industrial revolutions as well as the current fourth industrial revolution (4IR) cannot be overemphasized (Adelabu, Akinbogun & Odewole, 2019).

The Industrial design practice is preoccupied with solving human-oriented problems through the use of a combination of engineering, artistic and digital skills for creating concepts and user-friendly products. The three main career paths industrial designers mostly follow are: becoming an in-house designer at a company, working as a freelance designer or running a design studio; and becoming an entrepreneur by creating a product and setting up a company (Ginder-Vogel, 2016). It means that industrial designers are not often bent on getting employed by the government or an organization since they have been trained to be self-employed. This is one of the main reasons why Nigeria must pay more attention to the Industrial Design practices as it holds huge promise to help reduce the number of unemployed graduates to become self-employed and self-reliant.

Undergraduate Industrial Design Programme in Nigeria

Industrial Design programme in Nigeria is an offshoot of Fine Art programme as the Department of Industrial Design was carved out of the Department of Fine Art in the 1970s at the Ahmadu Bello Univeristy, Zaria (Adelabu & Fatuyi, 2020). Hence, till the present, the Industrial Design programme shares much similarities with the Applied Art programme offered in some tertiary institutions in Nigeria. Only four Universities in Nigeria offer the programme with the nomenclature Industrial Design, within the duration of between 4 and 5 years for the undergraduates (Adelabu & Fatuyi, 2020), while many other tertiary institutions offer Applied Art, Industrial Art, etc. as the case may be (Odewole & Adelabu, 2017). Different areas of specialization of the Industrial Design programme in Nigeria at its inception included ceramic design, graphic design, textile design and glass technology (Ario, Odji & Odewole, 2020). However, glass technology has now become a full fledge department with the name Glass and Silicate Technology (Abdullahi, 2020). Consequently, Industrial Design programme in Nigeria is now left with three specilization options: ceramic design, graphic design and textile design.

Non-popularity of Industrial Design Programme

One of the major limitations of the Industrial Design programme in Nigeria is the lack of substantial information about the discipline and the opportunities that come with it (Ario, Odji & Odewole, 2020). While Industrial design is increasingly recognized in Europe, Asia, and South Africa as a catalyst for enhancing human well-being, this is not the case in Nigeria as career seekers normally confront Industrial Design educators with a barrage of questions relating to the scope and concept of industrial design as well as the viability of the discipline in the labour market (Ogunduyile & Akinbogun, 2006). Despite that, the curriculum of the Industrial design programme encourages the development of creative skills most needed in the era of advanced and fast-paced technological development, many students as well as parents' lack of adequate knowledge of what the course entails can largely discourage their decision-making towards the course in choosing their prospective career. It thus implies that non-popularity of ID in Nigeria is hugely responsible for students' low patronage of the discipline.

The issue of students' low enrolment into the Industrial Design programme is not only experienced in Nigeria but also some other developing countries. Gaotlhobogwe (2010) decried low enrolment into the Design and Technology programme in Bostwana as it was not

considered of significant value but this was traceable to the novelty of the discipline within the study area as at the time the study was conducted. However, Industrial Design education cannot be said to be new in Nigeria as it has a history spanning over half a century. All these points to the fact that the creation of well-pronounced awareness of Industrial design to gain public empathy and advocacy in Nigeria is imperative.

Career Choice and the Nigerian Secondary School System

In Nigeria, secondary education is the link between primary education and tertiary education. Since the introduction of the Senior School Certificate in 1989, Nigeria has been running a 6-3-3 primary and secondary education system, consisting 6 years of primary education, 3 years of junior secondary education and 3 years of senior secondary education (Nuffic, 2017). In this sense, the Nigerian secondary school system is in two stages, that is, junior and senior levels of three years each, making a six-year duration. Secondary education finalizes the provision of basic education that started at the primary level, and focuses at laying the foundations for lifelong learning and human development, by offering more skill-oriented instructions (Garba, 2012). Secondary education is the training ground for future professionals as it provides the substructure for students to discover their specific fields of professions (Nanbak, 2020). According to Odewole (2018), the fact that career choice is being made by students at the secondary school makes it the most crucial level of education.

Influencers of Students' Career Perception and Choice

Many external and internal factors have been found to influence high school students when choosing their careers. These external factors include the influence of parents (home environment), teachers, and peers while internal factors could include the gender-stereotypic phenomenon (Ikkatai, Minamizaki, Kano, Inoue, McKay & Yokoyama, 2020) and self-efficacy among others. Other factors include media, culture, academic achievement, health condition, talents/skills, perceived high future earning (financial prospect), employment opportunities, prestige, recognition or social acceptability of the profession and work satisfaction among others (Kazi & Akhlaq, 2017). Regarding students' perception of Industrial design as a prospective course of study, the factors considered in this study include career awareness, the consciousness of inherent creative skills, gender suitability, and financial prospect.

Career Awareness

Career awareness is an important aspect of career perception given that the tendency that students will choose a particular career that they know little or nothing about is low (Odewole, 2018). The construct of career awareness towards making career decision is based on four aspects including knowledge, values, preferences, and self-concepts, which are connected with influencers (Family, School, Mass media, Community group, etc.) as well as self-assessment skills and decision-making skills (Yang, You & Han, 2010). Conducting early career awareness to young people such as secondary school students holds huge promise towards solving the prevalent problems of skill gap and competence in many countries across the globe (Cai, 2019). In this sense, in Nigeria, it is important to understand secondary school students' perception based on their level of awareness of Industrial Design as a prospective career.

The Consciousness of Inherent Creative Skills

Early awareness and consciousness of their inherent possession of 21st-century skills in no doubt affects students' choice of career regarding Industrial Design. While creativity is mostly required in the Industrial Design programme, it must be understood that it does not exist in human beings in isolation but co-manifests with other skills that have been jointly regarded as 21st-century skills. The consolidation of 21st-century skills into five categories and their general application as identified by Joynes, Rossignoli, and Amonoo-Kuofi (2019) including communication skills, collaborative skills, individual learning skills, autonomous skills as well as Information and Communication Technology (ICT) /digital literacy skills and their applicability in Industrial Design is as shown in Table 1.

Table 1. Categorization of 21st-century skills, its general application, and application in industrial design

Category of 21st Century Skill	General Application	Application in Industrial Design
Communication skills	Mastery of language use, presentation of ideas.	Understanding and interpreting design language for solving human-oriented problems; appropriate articulation of design approach involving conceptualization of ideas, prototyping, and mass production of value-added products that combine aesthetics with functionality; effective communication of design concepts and principles to non-designers; evoking visual interactions and persuasion through designs.
Collaborative skills	Management of group activities, social interaction.	Bringing together and managing a multi-disciplinary team of technologists
Individual learning skills	Critical thinking, metacognition, new skills acquisition	Design thinking; Optimization of new ideas and new materials for improving the quality and performance of products regarding their forms and functions.
Individual or autonomous skills	Flexibility, adaptability, entrepreneurship	Conducting design research, to understand different underlying technologies and matching appropriate technologies to solving problems for meeting multiple;
ICT / digital literacy skills	Use of ICT and digital tools	Product design and development through proficiency in the use of computer-aided design (CAD) and computer-aided manufacturing (CAM) tools.

Holland's Theory of Career Choice has been widely used by career experts to assist students in making the right choice of career based on the inherent personality traits that can be easily identified in the students. The emphasis of Holland's Theory of Career Choice is based on the fact that people who choose a career within the environment that fits their personality type are more likely to be successful and find satisfaction in their chosen career (Sheldon, Holliday, Titova & Benson, 2020; Zainudin, Rong, Nor, Yusop & Othman, 2020). Compared with the five categories of 21st-century skills earlier discussed, it is noteworthy that all the identified six personality traits in Holland's theory of career choice as shown in Figure 1 are found to be relevant in one way or the other towards executing the tasks involved in Industrial Design profession.

Figure 1. Holland's model of career choice

Source: University of Louisville (2022). Holland's theory of career choice. https://louisville.edu/career/resources/hollands-theory-of-career-choice

Gender Suitability

Gender suitability of a career becomes an important factor given that gender stereotyping is the main reason why there are lower representations of a particular gender in some academic disciplines than others. Millward, Houston, Brown and Barrett (2006) asserted that young people hold very strong stereotypes about the types of jobs that are appropriate for men and women, and these gender stereotypes pose barriers to stop them from going into non-traditional work since they use them as the basis for actively selecting themselves into or screening themselves out of the market for certain jobs. For instance, apart from insufficient early experience, masculine culture of the field of study and gender gaps in self-efficacy have been the major factors that are responsible for lower representation in some fields of physical sciences including Mathematics, Computer Science, Engineering, and Physics among others (Ikkatai, Minamizaki, Kano, Inoue, McKay, & Yokoyama, 2020). Given that the power of gender stereotypes to dictate occupational perception, preferences and decisions is undeniable, changing the way jobs are represented in the media can help create role models and change associations about work and gender (Millward, Houston, Brown, & Barrett, 2006). In this sense, creating appropriate and effective career awareness can go a long way to properly shape career perception not only on the issue of gender stereotyping but also other factors on which students' career choice depends. Given that the Industrial design programme has often seen low students' enrolment compared to some other well-patronized disciplines in Nigeria, it is imperative to have adequate knowledge about students' perception of the discipline regarding gender suitability among other factors.

Financial Prospect

There is no doubt that people are also influenced by prospects of high financial benefits in choosing a career (Nyamwange, 2016). In regards to whether Industrial design practices have good financial prospect or not, working for an organization or as a freelancer, an Industrial designer earns up to 58,200 USD/year while an Industrial Design Researcher earns up to 71,000 USD/year, an Interior Designer earns up to 48,700 USD/year, a Furniture

Designer earns up to 51,400 USD/year, an Automotive Designer earns up to 80,700 USD/year, Package Designer earns up to 51,000 USD/year and a TV/Movie/Theatre Set Designer earns up to 59,300 USD/year among others (Balan, 2021). In Taiwan, the income (including domestic and export income) of the design industry has been on the increase year on year: £931 million in 2004 and £1,075 million in 2006 (Yang, You & Han, 2010).

Methodology

Survey research was conducted among Nigerian secondary school students who volunteered to participate in the study based on a mixed method of sampling. Criterion sampling technique was used for the selection of respondents for this study given that only candidates at the senior secondary school level were considered eligible for the survey. However, all the three study arms in typical Nigerian senior secondary schools, that is, art, commercial, and science arms were given equal chance, and no gender biases were allowed as both female and male students were given equal chance to participate in the survey. A simple random technique was used to select the schools of the respondents. 500 questionnaires were distributed to the respondents (273 female and 227 male students) in selected secondary schools within Southwestern, Nigeria. Also, students' perceptions were evaluated based on each of the Industrial Design specialization options that are typically available in Nigerian tertiary institutions, that is, ceramics, graphics and textile design respectively. [Note that the arrangement of secondary school arm of study, gender as well as Industrial Design options as aforementioned are done in alphabetical order and does not in any way suggest an order of hierarchy]. The researchers personally supervised the administering and collection of the questionnaires to ensure that all the instruments distributed were adequately attended to and completely retrieved.

Research Questions

1. Is there any significant relationship between respondents' level of awareness of each of the respective areas of specialization in Industrial Design (ceramics, graphics, and textile) and their prospective choice of a career within the discipline?
2. Is there any significant relationship between respondents' gender and their prospective choice of career in each of the respective areas of specialization in Industrial Design (ceramics, graphics, and textile)?
3. Is there any significant relationship between the respondents' level of perception of required inherent creative skills and their prospective interest in each of the respective areas of specialization in Industrial Design (ceramics, graphics, and textile) as a career choice?

Hypotheses

The following null hypotheses were proposed for the study:

1a. There is no significant relationship between the respondents' awareness of the Industrial design discipline and their prospective choice of Ceramics design as a career.
1b. There is no significant relationship between the respondents' awareness of the Industrial design discipline and their prospective choice of Graphics design as a career.
1c. There is no significant relationship between the respondents' awareness of the Industrial design discipline and their prospective choice of Textile design as a career.
2a. There is no significant relationship between the respondents' gender and their prospective choice of Ceramics design as a career.
2b. There is no significant relationship between the respondents' gender and their prospective choice of Graphics design as a career.

2c. There is no significant relationship between the respondents' gender and their prospective choice of Textile design as a career.
3a. There is no significant relationship between the level of inherent creative skills of respondents and their prospective choice of Ceramics design as a career.
3b. There is no significant relationship between the level of inherent creative skills of respondents and their prospective choice of Graphics design as a career.
3c. There is no significant relationship between the level of inherent creative skills of respondents and their prospective choice of Textile as a career.

Tools for Data Collection Tools and Analysis

Both descriptive and inferential statistical tools were used for data analysis. The descriptive tool that was used to analyze the data include tables and percentages. The inferential statistical tool that was used to analyze the data for the hypotheses generated is Chi-Square (χ^2) since it is the most suitable tool for comparing two or more independent variables. The test statistic for Chi-Square is expressed as:

$$\chi 2 = \sum_{i=1}^{R} \sum_{j=1}^{C} (Oij - Eij)2 \,/Eij$$

Where χ^2 is Chi-Square, R is row, C is column, Oij is the observed frequency in the ith row and jth column, Eij is the expected frequency in the ith row and jth column; and degree of freedom, df = (R - 1) (C - 1).

Results and Discussion

The respondents in this study consist of 273 female and 227 male students making 54.6% and 45.4% of the population respectively. The responses of the respondents' perceptions of each of the respective areas of specialization in the Industrial design discipline (ceramics, graphics, and textile) based on some identified factors are as presented in Table 2.

Table 2. Respondents' responses on their perception of industrial design as a career

Career Perception Variables	**Responses**	**Industrial Design Options**		
		Ceramics	**Graphics**	**Textiles**
Awareness of the Discipline	Positive	291 (58.2%)	342 (68.4%)	419 (83.8%)
	Negative	209 (41.8%)	158 (31.6%)	81 (16.2%)
	Undecided	-	-	-
Level of Inherent Creative Skills	High	44 (8.8%)	81 (16.2%)	83 (16.6%)
	Moderate	161 (32.2%)	213 (42.6%)	242 (48.4%)
	Low	295 (59%)	206 (41.2%)	175 (35%)
Nature of the Discipline	Science-based	93 (18.6%)	108 (21.6%)	61 (12.2%)
	Art- based	163 (32.6%)	152 (30.4%)	174 (34.8%)
	Both	244 (48.8%)	240 (48%)	264 (53%)
Gender Suitability	Male-oriented	165 (33%)	136 (27.2%)	49 (9.8%)
	Female-oriented	33 (6.6%)	18 (3.6%)	133 (26.6%)

	Both	302 (60.4%)	346 (69.2%)	318 63.6%)
Financial Prospect	Positive	205 (41%)	265 (53%)	313 (62.6%)
	Negative	295 (59%)	235 (47%)	187 (37.4%)
	Undecided	-	-	-
Likeliness to Pursue Career	Positive	290 (58%)	328 (65.6%)	372 (74.4%)
	Negative	123 (24.6%)	112 (22.4%)	74 (14.8%)
	Undecided	87 (17.4%)	60 (12%)	54 (10.8%)

As shown in Table 2, on respondents' awareness of each of the areas of specialization in Industrial Design, the majority of the respondents showed a substantial level of positive perception for Ceramics (58.2%), Graphics (68.4%), and Textiles (83.8%) respectively. The reason why Textile has the highest percentage of positive responses on respondents' awareness could be because Textile is associated with fashion and clothing which every human being interacts with on daily basis.

With regards to the level of possession of inherent creative skills such as drawing, sketching, and creating objects as required for choosing a career in any of the identified areas of specialization in the Industrial Design, the majority of the respondents agreed that they possess a low level of inherent creative skills as required for studying Ceramics (59%) while the majority of the respondents agreed that they possess a moderate level of inherent creative skills as required for studying Graphics (42.6%) and Textile (48.4%) respectively.

The majority of the respondents agreed that each of the identified areas of specialization in the Industrial Design discipline is both science and art-oriented (48.8% for Ceramics, 48% for Graphics, and 53% for Textile respectively). This suggests that the respondents' perception of the nature of the Industrial Design discipline complies with their perception on awareness of the discipline given that the ideal concept and curriculum of Industrial Design as offered in tertiary institutions is a synergy of art and science.

Based on whether the respondents perceived Industrial Design as gender stereotypic or not, the majority of the respondents agreed that each of the identified areas of specialization in Industrial Design is suitable for both male and female (60.4% for Ceramics, 69.2% for Graphics and 63.6% for Textile respectively) which implies that the discipline is not largely perceived by the respondents as gender-biased.

In terms of perception on the financial prospect of each of the identified areas of specialization in Industrial Design, the majority of the respondents (59%) agreed that Ceramics has less financial prospect while the majority of the respondents agreed that Graphics (53%) and Textile (62.6%) respectively have more financial prospect. Concerning likeliness to pursue a career in each of the identified areas of specialization in Industrial Design, the majority of the respondents showed a higher percentage of positive responses for Ceramics (58%), Graphics (65.6%), and Textiles (74.4%) respectively.

Hypotheses Testing

Hypotheses 1a, 1b and 1c

Table 3. Relationship between respondents' awareness of industrial design and their prospective choice of career in areas of specialization option

Prospective choice of career in areas of specialization option		Career Awareness positive	Career Awareness negative	χ^2 df = 1	P
Ceramics	Positive	118	87	0.058	0.809
	Negative	173	122		
Graphics	Positive	243	99	141.594	0.000
	Negative	22	136		
Textile	Positive	282	31	24.435	0.000
	Negative	137	50		

$\chi^2 = 0.0583$, df (degree of freedom) = 1, $\chi^2/df = 0.0583$, $P(\chi^2 > 0.0583) = 0.809167$, hence, the alternate hypothesis is rejected while the null hypothesis which established a relationship between respondents' awareness of Industrial Design and their prospective choice of career in Ceramics option is accepted. Therefore, we conclude that there is no significant relationship between the respondents' awareness of the Industrial design discipline and their prospective choice of Ceramics as a career.

$\chi^2 = 141.5945$, df = 1, $\chi^2/df = 141.5942$, $P(\chi^2 > 141.5945) = 0.00001$, hence, the null hypothesis is rejected while the alternate hypothesis which established a relationship between respondents' awareness of Industrial Design and their prospective choice of career in Graphics option is accepted. Therefore, we conclude that there is a significant relationship between respondents' awareness of the Industrial design discipline and their prospective choice of Graphics as a career.

$\chi^2 = 24.4355$, df = 1, $\chi^2/df = 24.4355$, $P(\chi^2 > 24.4355) = 0.00001$, hence, the null hypothesis is rejected while the alternate hypothesis which established a relationship between respondents' awareness of Industrial Design and their prospective choice of career in Textile option is accepted. Therefore, we conclude that there is a significant relationship between respondents' awareness of Industrial Design discipline and their prospective choice of Textile as a career.

Hypotheses 2a, 2b and 2c

Table 4. Relationship between respondents' gender and their prospective choice of career in areas of specialization option

Prospective choice of career in areas of specialization option		Male	Female	χ^2 df = 1	P
Ceramics	Positive	118	87	20.7296	0.000
	Negative	109	186		
Graphics	Positive	126	139	1.049	0.306
	Negative	101	134		
Textile	Positive	141	172	0.042	0.838
	Negative	86	101		

$\chi^2 = 20.7296$, df = 1, $\chi^2/df = 20.7296$, $P(\chi^2 > 20.7296) = 0.00001$, hence, the null hypothesis is rejected while the alternate hypothesis which established a relationship between respondents' gender and their prospective choice of career in Ceramics option of Industrial Design is accepted. Therefore, we conclude that there is a significant relationship between the respondents' gender and their prospective choice of Ceramics as a career.

$\chi^2 = 1.0487$, df = 1, $\chi^2/df = 1.0487$, $P(\chi^2 > 1.0487) = 0.306$, hence, the null hypothesis is not rejected while the alternate hypothesis which established a relationship between respondents' gender and their prospective choice of career in Graphics Option of Industrial Design is rejected. Therefore, we conclude that there is not a significant relationship between the respondents' gender and their prospective choice of Graphics as a career.

$\chi^2 = 0.0419$, df = 1, $\chi^2/df = 0.0419$, $P(\chi^2 > 0.0419) = 0.837905$, hence, the null hypothesis is accepted while the alternate hypothesis which established a relationship between respondents' gender and their prospective choice of career in Textile option of Industrial Design is rejected. Therefore, we conclude that there is no significant relationship between the respondents' gender and their prospective choice of Textile design as a career.

Hypotheses 3a, 3b and 3c

Table 5. Relationship between respondents' level of inherent creative skills and their prospective choice in areas of specialization option

Prospective choice of career in areas of specialization option		Inherent Creative Skills			χ^2 df = 2	P
		High	Moderate	Low		
Ceramics	Positive	22	78	165	2.517	0.284
	Negative	22	83	130		
Graphics	Positive	34	124	107	6.371	0.041
	Negative	47	89	99		
Textile	Positive	44	153	68	24.205	0.000
	Negative	39	89	107		

$\chi^2 = 2.5169$, df = 2, $\chi^2/df = 0.0419$, $P(\chi^2 > 2.5169) = 0.284096$, hence, the null hypothesis is not rejected while the alternate hypothesis which established a relationship between respondents' level of inherent creative skills and their prospective choice of career in Ceramics option of Industrial Design is rejected. Therefore, we conclude that there is not a significant relationship between the level of inherent creative skills and their prospective choice of Ceramics as a career.

$\chi^2 = 6.3712$, df = 2, $\chi^2/df = 3.19$, $P(\chi^2 > 6.3712) = 0.041353$, hence, the null hypothesis is rejected while the alternate hypothesis which established a relationship between respondents' level of inherent creative skills and their prospective choice of career in Graphics option of Industrial Design is accepted. Therefore, we conclude that there is a significant relationship between the level of inherent creative skills and their prospective choice of Graphics as a career.

$\chi^2 = 24.2054$, df = 2, $\chi^2/df = 12.10$, $P(\chi^2 > 24.2054) = 0.00001$, hence, the null hypothesis is rejected while the alternate hypothesis which established a relationship between respondents' level of inherent creative skills and their prospective choice of career in the Textile option of Industrial Design is accepted. Therefore, we conclude that there is a significant relationship between the level of inherent creative skills and their prospective choice of Textile as a career.

Summary of Findings

There is no significant relationship between the respondents' awareness of Industrial design discipline and their prospective choice of Ceramics as a career, there is a significant relationship between respondents' awareness of Industrial design discipline and their

prospective choice of Graphics as a career; there is a significant relationship between respondents' awareness of Industrial Design discipline and their prospective choice of Textile as a career. This implies that many students have less awareness of Ceramics design as a career compared to Graphics and Textile design. This could be due to the recent non-popularity of pottery practice which used to be one of the most pronounced domains of Ceramic designs in Nigeria (Adelabu, Odewole & Kashim, 2019) compared to the popularity of signwriting, photography and animation as some of the well-pronounced domains of Graphics design as well as popularity of tailoring and fashion design as domains of Textile design.

There is a significant relationship between the respondents' gender and their prospective choice of Ceramics as a career, there is not a significant relationship between the respondents' gender and their prospective choice of Graphics or Textile as a career; It, therefore, implies that many students consider Ceramics as gender-stereotypic but Graphic and Textile design as suitable for both male and female gender. This presents the need for enhanced awareness creation on the suitability of all the areas of specialization of Industrial design for both male and female gender. According to Gaotlhobogwe (2010), girls generally tend to perceive design education as difficult. Teachers of Industrial Design (most especially females) can help correct this notion through motivations. Research findings have shown that students' enrolment into the Design programme can be improved by reinforcing students' perception of design career as an enjoyable life-skill (Gaotlhobogwe, 2010).

There is not a significant relationship between the level of inherent creative skills and their prospective choice of Ceramics as a career, there is a significant relationship between the level of inherent creative skills and their prospective choice of Graphics or Textile as a career. In this regard, it is obvious that most of the students consider inherent creative skills as a major prerequisite for choosing any of the identified areas of specialization of Industrial Design as a career. It is important to note that every individual personality trait according to Holland's Theory of Career Choice (enterprising, conventional, realistic, investigative, artistic and social) can find a place of relevance within the Industrial Design work environment given that the discipline is multi-faceted and accommodates a wide range of inter-disciplinary interactions. Given that employability attributes that are mostly sought-after in Industrial design jobs are generally classified into personal qualities, core skills and process skills, students can strategically focus their efforts on developing these traits to launch a profitable career (Ramírez, 2012).

Recommendations

In the light of the findings in this study, the following recommendations are provided:

(i) Creating more pronounced awareness on the concepts, prospects and non-gender stereotypic nature of Industrial Design in the media holds a great promise to help improve the masses' knowledge and appreciation of the discipline as well as promote students' enrolment into the discipline;

(ii) Industrial designers in the country should do more to exhibit their innovations or products in such a way that will catch the attention of the masses;

(iii) Teachers of Industrial design in tertiary institutions should adopt a sound pedagogical and pragmatic approach in the delivery of the curriculum to assist their students to discover and exploit their inherent creative skills to suit global best practices of the 21st-century;

(iv) Stakeholders in the field of Industrial design and ministry of education should make adequate efforts to introduce basic aspects of Industrial design curriculum at the

secondary school level of education just like it is obtainable at present with many science-based disciplines;

(v) Government should make grants and funding available to support and promote Industrial design education and praxis.

Conclusion

Given that there are significant relationships as there are no significant relationships between different identified factors of students' perception in this study and their interest in Industrial Design as a prospective career, the findings in this research has therefore revealed that students' perception of Industrial Design as a prospective career is not as poor as some previous researches have erroneously projected. A suitable explanation to this could be because most previous researches in this line are more theoretical-based rather than empirical-based. Irrespective of the fact that more respondents showed negative responses on the perception of financial prospect and low level of inherent skills as required to study Ceramics, the majority of the respondents are likely to pursue Ceramics as a career just like the majority of the respondents is likely to pursue Graphics and Textile which were perceived to have higher financial prospect. This presents an interesting area for further study. This study was limited to Southwest, Nigeria. Further studies should seek to cover all the six geopolitical regions in the country. It is also important to explore students' perception of the Industrial design programme in other developing countries. Conducting a comparative study across different developing countries regarding the issue raised in this present study is another worthwhile area for further research.

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Genişletilmiş özet

Giriş

Kariyer yolu, iş, meslek, meslek veya meslek olarak da adlandırılan kariyer, bir kişinin yaşamının istihdamla, yani bir kişinin geçimini sağlamak için yaptığı şeyle ilgili bir yönüdür. Kariyer seçimi, belirli bir kariyer yolunun seçimini ifade eder. Algı, organizmaların anlamlı bir dünya deneyimi üretmek için duyumları yorumladığı ve düzenlediği süreç olarak tanımlanır (Pickens, 2005). Bu nedenle kariyer algıları temel olarak gençlerin aldığı imajlardan oluşur (Fosket ve Hemsley-Brown, 1999). Kariyer seçimi, olumlu ya da zararlı psikolojik, fiziksel ve sosyo-ekonomik gelecekteki yaşamı belirlediği düşünüldüğünde karmaşık bir karardır (Akosah-Twumasi, Emeto, Lindsay, Tsey & Malau-Aduli, 2018).

Kariyer kararı, her öğrencinin yüksek öğrenim düzeyine hazırlanırken atması gereken en önemli adım olduğundan, öğrencilerin kariyer algıları, kararlarını ve belirli bir kariyer yolunu seçmelerini teşvik edebileceğinden veya caydırabileceğinden, kariyer kararlarını belirlemede uzun bir yol kat eder. Bu nedenle, gençlerin kariyerleri hakkında nasıl karar verdiklerini ve bunun yüksek öğrenim yollarının seçimlerini nasıl etkilediğini ve bunlarla nasıl etkileşime girdiğini anlamak kritik derecede önemli bir konudur (Fosket & Hemsley-Brown, 1999).

Nijerya'da, diğer birçok gelişmekte olan ülkede olduğu gibi, kariyer karar verme sürecinde yer alan ortaokul öğrencileri, farklı sosyal ve ekonomik koşullar nedeniyle sıklıkla önemli zorluklarla karşılaşmaktadır (Odji ve Rahman, 2020). Bunun nedeni, gelişmekte olan ülkelerin öğrencilerini, ülkelerinin algılanan ihtiyaçlarına göre kariyerlere yönlendirme eğiliminde olmaları olabilir (Kazi ve Akhlaq, 2017). Nijerya'da yükseköğretim kurumlarından mezun olduktan sonra artan işsizlik oranı nedeniyle, kariyer yollarına bakılmaksızın yükseköğretim kurumlarındaki tüm öğrenciler için mesleki ve girişimcilikle ilgili derslerin öğretilmesine ve öğrenilmesine vurgu yapılmıştır (Nwite, 2016). Bunun nedeni, Odewole'ye (2016) göre mesleki ve girişimcilikle ilgili kursların olmasıdır. Örneğin, Endüstriyel tasarım, mezun olduktan sonra iş fırsatlarını garanti etme konusunda büyük bir potansiyele sahiptir. Eğer bu doğruysa, hemen akla gelen soru şudur: Endüstriyel Tasarım disiplini, Nijerya'da akademik bir disiplin olarak sunulduğu çeşitli yükseköğretim kurumlarında neden genellikle az sayıda öğrenciye sahiptir? Bu soruya uygun bir cevap bulmak için, bu çalışma, ortaokul öğrencilerinin disipline ilişkin farkındalıkları, gerekli doğuştan gelen yaratıcı becerilerin düzeyleri ve disiplinin finansal beklenti, doğası ve cinsiyete uygunluğu açısından disiplini etkileyebilecek faktörler olarak algılarını araştırmaktadır. Endüstriyel Tasarım seçimlerini ileriye dönük bir kariyer olarak ya tetikler ya da caydırır.

Yöntem

Anket araştırması, karma örnekleme yöntemine dayalı olarak araştırmaya katılmaya gönüllü olan Nijeryalı ortaokul öğrencileri arasında yapılmıştır. Sadece ortaokul düzeyindeki adayların anket için uygun kabul edildiği göz önüne alındığında, bu çalışma için katılımcıların seçiminde ölçüt örnekleme tekniği kullanılmıştır. Bununla birlikte, tipik Nijerya liselerindeki üç çalışma kolunun tümüne, yani sanat, ticaret ve bilim kollarına eşit şans verildi ve hem kız hem de erkek öğrencilere ankete katılmaları için eşit şans verildiğinden hiçbir cinsiyet önyargısına izin verilmedi. . Ankete katılanların okullarını seçmek için basit bir rastgele

teknik kullanıldı. Güneybatı, Nijerya'da seçilen ortaöğretim okullarındaki katılımcılara 500 anket dağıtıldı. Ayrıca, öğrencilerin algıları, tipik olarak Nijerya yükseköğretim kurumlarında bulunan sırasıyla seramik, grafik ve tekstil tasarımı gibi Endüstriyel Tasarım uzmanlık seçeneklerinin her birine dayalı olarak değerlendirildi. [Ortaokul eğitim kolu, cinsiyet ve Endüstriyel Tasarım seçeneklerinin yukarıda belirtildiği gibi düzenlenmesinin alfabetik sıraya göre yapıldığını ve hiçbir şekilde bir hiyerarşi sırası önermediğini unutmayın]. Araştırmacılar, dağıtılan tüm araçlara yeterince dikkat edildiğinden ve tamamen geri alındığından emin olmak için anketlerin uygulanmasını ve toplanmasını kişisel olarak denetledi.

Sonuçlar

Ankete katılanların Endüstriyel tasarım disiplini konusundaki farkındalıkları ile kariyer olarak olası Seramik seçimi arasında anlamlı bir ilişki yoktur, buna karşılık, katılımcıların Endüstriyel tasarım disiplini konusundaki farkındalıkları ile kariyer olarak olası Grafik seçimleri arasında ve Tekstil'i seçmeleri arasında önemli bir ilişki vardır. Bu, birçok öğrencinin Grafik ve Tekstil tasarımına kıyasla kariyer olarak Seramik tasarımı konusunda daha az farkındalığa sahip olduğu anlamına gelir. Bunun nedeni, Nijerya gibi gelişmekte olan ülkelerde Seramik tasarımlarının en belirgin alanlarından biri olan çanak çömlek uygulamasının son zamanlarda tabela, fotoğraf ve animasyon gibi uygulamalar karşısında popülaritesini kaybetmesi (Adelabu, Odewole & Kashim, 2019) ile ilişkili olabilir. Tekstil tasarımının alanları olarak terzilik ve moda tasarımının popülerliğinin yanı sıra Grafik tasarımının iyi telaffuz edilen alanlarından bazıları olarak.

Ankete katılanların cinsiyeti ile kariyer olarak olası Seramik seçimi arasında ve katılımcıların cinsiyeti ile kariyer olarak muhtemel Grafik seçimi arasında anlamlı bir ilişki vardır; Ankete katılanların cinsiyeti ile kariyer olarak tekstili tercih etmeleri arasında anlamlı bir ilişki bulunamamıştır. Bu bulgu, birçok öğrencinin Seramik ve Grafik tasarımını toplumsal cinsiyet klişesi olarak gördüklerini, ancak Tekstil tasarımını hem erkek hem de kadın cinsiyetine uygun olarak gördüklerini ima eder. Bu, Endüstriyel tasarımın tüm uzmanlık alanlarının hem erkek hem de kadın cinsiyet için uygunluğu konusunda gelişmiş farkındalık yaratma ihtiyacını ortaya koymaktadır.

Doğuştan gelen yaratıcı becerilerin düzeyi ile olası kariyer (Seramik, Grafik, Tekstil) seçimleri arasında önemli bir ilişki vardır. Bu bağlamda, öğrencilerin çoğunun, Endüstriyel Tasarımın belirlenmiş uzmanlık alanlarından herhangi birini bir kariyer olarak seçmek için

doğuştan gelen yaratıcı becerileri önemli bir ön koşul olarak gördüğü açıktır. Disiplinin çok yönlü olduğu ve çok çeşitli disiplinler arası etkileşimleri barındırdığı göz önüne alındığında, her bireysel kişilik özelliğinin (Hollanda'nın Kariyer Seçimi Teorisine göre) Endüstriyel Tasarım çalışma ortamında uygun bir yer bulabileceğini belirtmek önemlidir.

Öneriler

Bu çalışmada öğrencilerin algılarının farklı tanımlanmış faktörleri ile ileriye dönük bir kariyer olarak Endüstriyel Tasarıma olan ilgileri arasındaki göz önüne alındığında, bu araştırmadaki bulgular öğrencilerin Endüstriyel Tasarım algısını şu şekilde ortaya koymuştur. İleriye dönük bir kariyer, önceki bazı araştırmaların hatalı bir şekilde öngördüğü kadar zayıf değildir. Bunun nedeni, bu alandaki önceki araştırmaların çoğunun ampirik temelli olmaktan çok teorik temelli olması olabilir. Daha fazla katılımcının, Seramik okumak için gerekli olan kazançlılık ve düşük düzeyde doğuştan gelen beceriler algısı konusunda olumsuz yanıtlar vermesi gerçeğinden bağımsız olarak, katılımcıların çoğunluğunun muhtemelen daha kazançlı olarak algılanan Grafik ve Tekstil'i seçmesi gibi, ankete katılanların çoğunluğu da Seramik'i bir kariyer olarak takip ediyor. Bu, daha fazla çalışma için ilginç bir alan sunar. Bu çalışma Güneybatı, Nijerya ile sınırlandırılmıştır. Daha ileri çalışmalar ülkedeki altı jeopolitik bölgenin tamamını kapsamaya çalışmalıdır. Öğrencilerin diğer gelişmekte olan ülkelerdeki Endüstriyel tasarım programına ilişkin algılarını araştırmak da önemlidir. Bu çalışmada gündeme getirilen konu ile ilgili olarak farklı gelişmekte olan ülkeler arasında karşılaştırmalı bir çalışma yürütmek, daha fazla araştırma için uygun bir başka alandır.