

Investigating the Rationale Interaction Design Integration in Design Education Frameworks

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Abstract

The need to include interface design into design education courses is explored in this research. It uses a combination of quantitative (a survey questionnaire) and qualitative (expert interviews, content analysis) methodologies, drawing from a mixed-methods approach. In this quantitative study, 350 students from public and private design schools in Maharashtra, India, were asked about their thoughts on the significance of interaction design, the demand for professionals with these skills in the workplace, their interest in and likelihood of enrolling in an interaction design programme, and their plans for further education. Interviews and examination of institutional papers were among the qualitative data sources. Importantly, the results show that a large portion of the population is aware of the need for experts in the field of interaction design (43% very/somewhat aware) and is very interested in learning more about its characteristics (58% extremely interested). Incorporating these abilities would increase employment competitiveness, according to 43% of respondents, and 43% of those same people think interface design is vital for satisfying industry demands. The significance and worth of interface design, however, were unclear to several respondents. In order to keep up with the ever-changing demands of businesses and give students a leg up when applying for jobs, the research stresses the need of incorporating interaction design principles into design programmes. The discussion focuses on the suggestions and implications for the construction of curricula.

Keywords Industry, Design, Interaction, Maharashtra and Institutional.

Introduction

The term "interaction design," for short, refers to "the practice of designing interactive digital products, environments, systems, and services." While interaction designers are also concerned with aesthetics (as they are in other design disciplines), [1] they put far more emphasis on how things function. Interaction design is a creative process that envisions potential futures rather than analyzing the present. This aspect of IxD is what sets it apart as a design area, as opposed to a scientific or engineering one. [2] Interaction designers draw from many disciplines, including psychology, HCI, IA, and UX research to craft products that are optimal for their intended audience. This entails knowing where and how the product will be used, what the users' goals & habits are, and coming up with creative ways to meet those demands.

Interaction design, in contrast to fields like software engineering, prioritizes the needs of users and enhancing their experience within any applicable technical or business restrictions. [3]

Designing for user interaction encompasses more than just the final product or service itself; it's called "Interaction Design." While the phrase "Interaction Design" is most commonly associated with the design of human interaction with digital items, it is also relevant when considering how people interact with physical objects. [4] The education industry is experiencing significant changes and developments, driven primarily by advancements in technology and the impact of global events. Here are some key trends and observations in the education industry:

- **Blended Learning and Online Education:** The COVID-19 pandemic accelerated the adoption of online education and blended learning models. Many educational institutions now offer a

combination of in-person and online classes, providing flexibility and access to a broader range of learners.[5]

- Remote and Hybrid Learning: Remote learning has become more prevalent, allowing students to attend classes from anywhere with internet access. Hybrid learning models combine in-person and online elements, providing a mix of traditional classroom instruction and digital learning experiences.[6]
- Ed. Tech Innovation: The education technology (EdTech) sector continues to witness rapid growth. New and innovative tools, platforms, and applications are being developed to enhance teaching, learning, assessment, and collaboration.
- Personalized Learning: Educational institutions are increasingly focusing on personalized learning approaches. Technology enables adaptive learning platforms, where content and pacing are tailored to individual students' strengths, weaknesses, and learning styles.
- Lifelong Learning and Up-skilling: The concept of lifelong learning has gained prominence as individuals seek continuous education and up-skilling to adapt to the evolving job market and stay relevant in their careers.
- Emphasis on Skills and Competencies: There is a shift in educational goals towards developing essential skills and competencies, such as critical thinking, problem-solving, creativity, communication, and collaboration, alongside traditional academic subjects.[7]
- Augmented and Virtual Reality in Education: Augmented reality (AR) and virtual reality (VR) technologies are finding applications in education, offering immersive and interactive learning experiences in various subjects.
- Increased Focus on Mental Health and Well-being: Educational institutions are paying more attention to students' mental health and well-being, recognizing the importance of providing a supportive environment to promote overall success and academic achievement.
- Alternative Credentialing and Micro credentials: Besides traditional degrees, alternative forms of credentialing, such as micro credentials and digital badges, are gaining traction as a way to recognize and showcase specific skills and accomplishments.
- Data-Driven Decision Making: Educational institutions are leveraging data analytics to gain insights into student performance and engagement, enabling better-informed decision-making processes to improve learning outcomes.[8]
- Environmental Sustainability: Sustainability initiatives are becoming more prominent in educational settings. Schools and universities are adopting eco-friendly practices and incorporating environmental education into their curricula.
- Global Collaboration and Exchange Programs: The digital age enables increased global collaboration and exchange programs between educational institutions, allowing students to engage with peers from different countries and cultures.
- Online Assessments and Proctoring: Online assessment platforms and remote proctoring solutions are being used to conduct exams securely and maintain academic integrity in virtual learning environments.

User experience (UX) design is the process design teams use to create products that provide meaningful and relevant experiences to users. UX design involves the design of the entire process of acquiring and integrating the product, including aspects of branding, design, usability and function.[9]

Designing an experience includes not only making the software easy to use but also designing the other experiences related to the product, for example, the marketing campaign, the packaging and after-sales support. Most importantly, UX design is concerned with delivering solutions that address pain points and needs. After all, no one will use a product that serves no purpose.

“User Experience Design” is often used interchangeably with terms such as “User Interface Design” and “Usability.” However, while usability and user interface (UI) design are important aspects of UX design, they are subsets of it.

A UX designer is concerned with the entire process of acquiring and integrating a product, including aspects of branding, design, usability and function. It's a story that begins before the device is even in the user's hands.[10]

Products that provide a great user experience (e.g., the iPhone) are thus designed with the product's consumption or use in mind and the entire process of acquiring, owning and even troubleshooting it. Similarly, UX designers don't just focus on creating usable products; they concentrate on other aspects of the user experience, such as pleasure, efficiency and fun. Consequently, there is no single definition of a good user experience. Instead, a good user experience meets a particular user's needs in the specific context where they use the product.

The International Organization for Standardization (ISO) defines user experience as:

We can break this definition into two parts:

1. A person's perceptions and responses.
2. The use of a product, system or service.

In user experience, designers do not have much control over a person's perceptions and responses—the first part of the definition. For example, they cannot control how someone feels, moves their fingers or controls their eyes as they use a product. However, designers can control how the product, system or service behaves and looks—the second part of the definition.[11]

The simplest way to think about user experience design is as a verb and a noun. A UX designer designs (verb)—ideates, plans, changes—the things that affect the user experience (noun)—perceptions and responses to a system or service.

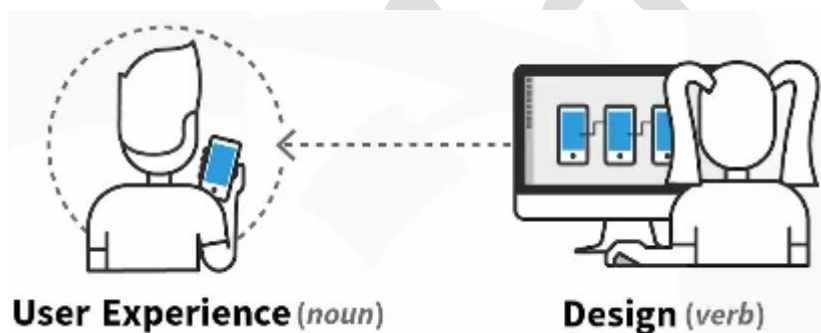


Figure 1: Interaction design foundation

The simplest way to think about user experience design is as a verb and a noun.

For example, when using a physical device, such as a computer mouse, we can control some aspects of the product that influence whether the user enjoys looking at, feeling and holding it:

- The way it fits in their hand. Is it snug? Is it too big and cumbersome?
- The weight. Does it affect their ability to move it as they wish?
- Its ease of use. Can they use it automatically, or do they have to think hard about it to achieve a goal?

When a person uses a digital product, such as a computer application, a few aspects that we can influence include:

- How intuitively they can navigate through the system.
- The cues that help guide them to their goal.
- The visibility of the essential aspects of a task at the appropriate time.

As a UX designer, you should consider the *Why*, *What* and *How* of product use. The *Why* involves the users' motivations for adopting a product, whether they relate to a task they wish to perform with it or to values and views that users associate with the ownership and use of the product. The addresses the things people can do with a product—its functionality. Finally, the *How* relates to the design of functionality in an accessible and aesthetically pleasant way.[12]

UX designers start with the *Why* before determining the and then, finally, the *How* to create products that users can form meaningful experiences with. In software designs, you must ensure the product's

“substance” comes through an existing device and offers a seamless, fluid experience.[13]

Since UX design encompasses the entire user journey, it’s a multidisciplinary field—UX designers come from various backgrounds such as visual design, programming, psychology and interaction design. To design for human users also means working with a heightened scope regarding accessibility and accommodating many potential users’ physical limitations, such as reading small text.[14]

A UX designer’s typical tasks vary but often include user research, creating personas, designing wireframes and interactive prototypes, and testing designs. These tasks can vary significantly from one organization to the next. Still, they always demand designers to be the users’ advocates and keep their needs at the center of *all* design and development efforts. That’s also why most UX designers work in some form of user-centered work process and keep channeling their best-informed efforts until they address all of the relevant issues and user needs optimally.[15]

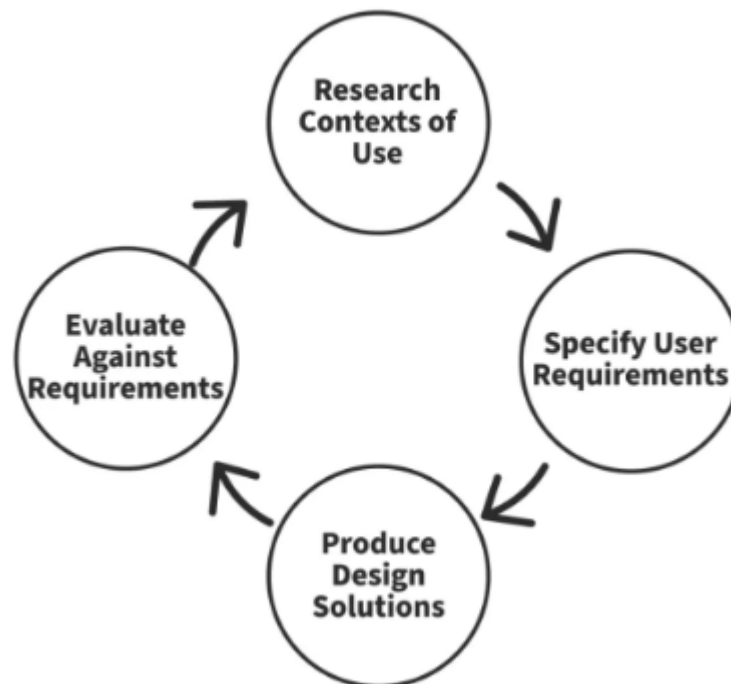


Figure 2 Interaction design iterative process

User-centered design is an iterative process where you take an understanding of the users and their context as a starting point for all design and development.

Methodology

Overview of the Research Plan

To address the research question/hypothesis adequately, this study adopted a mixed methods research, comprising quantitative and qualitative methods. Both methods provided different types of data, i.e., closed-ended data in the case of quantitative and open-ended data in the case of qualitative. The rationale for using both methods is to use the strong points of both and to minimize the limitations of either method used singly. Database from one method could help to explain the other database, and also help to explore different types of questions so that one database could build on other databases.

To conduct the study, quantitative research utilized survey questionnaire as the method of enquiry with data sources as online survey responses. For qualitative research, expert interview and content analysis were used as methods of enquiry with data sources as interviews, and documented contents such as institutional documents, mandates, mission/vision statements, curricular material. Strategies adopted for data analysis and validation was: descriptive analysis, thematic analysis, cross analysis, triangulation, and respondent validation.

Survey Questionnaire. Survey questionnaire provides the scope of using a large cross-section of sample size to ensure greater objectivity and accuracy of results. It is an economical way of reaching out to a large number of respondents within a limited time span. In this study, a key objective behind devising the survey questionnaire was to gain insights about issues related to the research area from respondents associated with a large number of design education programmes from Maharashtra based government and private universities and design industry. This would contribute in constructing a 'contemporary profile' of the design education programme to examine their role in imparting socially responsible design values.

Data Source: online survey response. The online survey was created using a Google survey form. This software as a service (SaaS) allowed advanced features for: survey design; responsive adaptation to all major web browsers and operating platforms on desktops, tablets and other mobile devices; survey distribution and tracking; secured data collection and storage; and report generation in multiple formats.

The questionnaire was specifically developed for this study. It comprised 14 closed-ended questions. The closed-ended questions consisted of multiple-choice questions, dichotomous questions, and rating scale questions.

For conducting the survey, 650 participation requests were sent out to individuals, institutional functionaries of design education programmes, association of designers, design studios and their social media networks to further circulate the survey participation request in their network of: students, faculty members, association/group members, design employees, and trainees respectively. The online survey questionnaire was accessible on the Internet through URLs that were distributed along with participation requests. The survey was accessible on the survey-portal for three months. The data was collected at the end of the given period and statistically analyzed using graphs, charts, and tables.

A total 350 respondents participated in the survey. These respondents comprise current or past design educators, current or past design students, and past design students who, subsequently, got involved in design education in India. These respondents represent experiences from a cross-section of over 100 design education programmes/institutions/departments from different parts of India with their current or past institutional affiliations.

Qualitative Research Method

The nature of the research hypothesis bears the importance of the qualitative research in detail, with the foci on interviews and document analysis. In qualitative research, words are important. This research emphasizes the value-laden nature of inquiry, as they are information-rich and insightful. In this method, although the sample size is small, it helps to generate information in a comprehensive and in-depth manner.

To study this problem, qualitative researchers use an emerging qualitative approach to inquiry, the collection of data in a natural setting sensitive to the people and places under study, and data analysis that is inductive and establishes patterns or themes.

Much of the literature on qualitative research commends employing multiple sources of information rather than relying on a single data source. In this study, expert interview and content analysis were the two chosen qualitative methods of enquiry with interviews and documented contents as their respective data sources.

Data Analysis and Validation

This section describes the strategies that were adopted for analysis and validation of data in this study. Analyzing the data forms a significant aspect of any research. The purpose of analysis is to answer the research question by categorizing and classifying data to draw meaningful/intelligible interpretations.

In quantitative research, the sole approach to data is statistical and is tabulated for analysis. Findings are usually descriptive in nature although within the numerical framework. While quantitative analysis serves as a useful evaluation tool, it is often combined with the complementary research and evaluation tool of qualitative research, as in the case of the present study.

“Data analysis in qualitative research consists of preparing and organizing the data (i.e., text data as in transcripts, or image data as in photographs) for analysis, then reducing the data into themes through a process of coding and condensing the codes, and finally representing the data in figures, tables, or a discussion” (Creswell, 2007). When both quantitative and qualitative analyses are used together, they can provide useful information to make informed decisions.

Sampling Selection

- From the Maharashtra mostly Pune and Mumbai, private or government universities of Design Colleges.
- In the Maharashtra private universities having, Design and fine arts Courses.
- Sampling from expert’s interview and Industry people.

Results

Government Universities in Maharashtra (mostly Pune and Mumbai): 55%: This category represents respondents who are affiliated with government universities in Maharashtra, primarily located in Pune and Mumbai. These respondents are associated with institutions offering courses related to Design.

Private Universities in Maharashtra: 35%: This group consists of respondents from private universities in Maharashtra. These universities offer courses in Design. The respondents in this category are likely to have a different institutional affiliation compared to those in government universities.

Experts and Industry People: 10%: This category includes individuals identified as experts and professionals from the industry. These respondents are not necessarily associated with specific educational institutions but are likely to have expertise and experience in the fields of Design.

Table 1: Categories of online survey respondents

Categories of online survey respondents	Percentage
From the Maharashtra mostly Pune and Mumbai, government universities of Design Colleges	55.00%
Maharashtra private universities having Design Courses.	35.00%
expert’s and Industry people	10.00%

Gender profile of respondents

A higher percentage of respondents, 58%, are men and 42% are Women. Here's an interpretation: Male: 58% of the respondents identified as male. This suggests that a majority of the participants in the survey or study are men.

Female: 42% of the respondents identified as female. This indicates that a smaller but still significant portion of the participants are women.

Table 2: Gender profile of respondents

Gender profile of respondents	Percentage
Male	58.00%
Female	42.00%

- **Age profile of respondents**

The "Age profile of respondents percentage" breakdown indicates the distribution of survey or research participants across different age groups. Here's an interpretation of the provided percentages: 18-20: 5% of the respondents fall within the age range of 18 to 20 years. This group represents a small portion of the surveyed population. 21-24: Another 5% of the respondents fall within the age range of 21 to 24 years. Similar to the 18-20 group, this is a relatively small proportion. 25-29: 10% of

the respondents are in the age group of 25 to 29 years. This group is larger than the previous two and contributes more significantly to the overall distribution.30-34: A larger portion, 20%, falls within the age range of 30 to 34 years. This suggests a notable presence of participants in their early thirties. 35 and above: The majority, 60%, of the respondents are 35 years old or above. This is the largest age group in the survey, indicating that a substantial portion of the participants are aged 35 and older. The following table 4.3, along with bar graph, shows the percentage of respondents per age category.

Table 3: Age profile of respondents

Age profile of respondents	Percentage
18-20	5%
21-24	5%
25-29	10%
30-34	20%
35 and above	60%

- **Academic qualifications of respondents.**

The statement "Response Categories Percentage" provides information on the distribution of survey or research participants based on their level of education. Here's an interpretation of the provided percentages:

Bachelor's degree or equivalent: 28% of the respondents have a Bachelor's degree or an equivalent level of education. This represents a relatively smaller portion of the surveyed population.

Master's degree or equivalent: The majority, 60%, of the respondents hold a Master's degree or an equivalent level of education. This indicates that a significant proportion of the participants have pursued education beyond the undergraduate level.

Ph.D.: 5% of the respondents have a Ph.D. This is a smaller percentage, suggesting that a minority of the participants have attained the highest level of academic qualification.

Others: 7% of the respondents fall into the "Others" category, which could include individuals with different types of qualifications, vocational training, or educational backgrounds not covered by the specified categories. The percentage of respondents by their highest academic qualification is given in table 4.4.

Table 4: Academic Qualification of Respondents

Response Categories	Percentage
Bachelor's degree or equivalent	28%
Master's degree or equivalent	60%
Ph.D.	5%
Others	7%

Respondents involved with professional design practice

The statement "Involvement of respondents with professional design practice Percentage: Yes 88%, No 12%" reveals the extent to which survey or research participants are engaged in professional design practice. Here's an interpretation of the provided percentages:

Yes: 88% of the respondents are involved in professional design practice. This indicates that the overwhelming majority of participants in the survey have some level of engagement or experience in a professional design-related field.

No: 12% of the respondents are not involved in professional design practice. This represents a smaller portion of the surveyed population, suggesting that there is a minority of participants who may not have direct involvement in the professional design field.

Table 5: Respondents with Experience of Professional Design Practice

Involvement of respondents with professional design practice	Percentage
Yes	88%
No	12%

- **Interest of the studying the features of interaction design as part of your college curriculum**

The statement "Interest in studying the features of interaction design as part of your college curriculum Percentage" provides insights into the enthusiasm of survey respondents regarding the incorporation of interaction design features into their college curriculum. Here's an interpretation of the provided percentages:

Very interested: 58% of the respondents express a high level of interest in studying the features of interaction design. This suggests a significant majority of participants are keenly interested in incorporating interaction design elements into their college education.

Somewhat interested: 18% of the respondents indicate a moderate level of interest. While not as enthusiastic as those "very interested," this group still expresses a positive inclination toward studying interaction design features.

Neutral: 12% of the respondents are neutral, implying that they neither strongly oppose nor strongly support the idea of studying interaction design features. This group is relatively indifferent or has not formed a strong opinion on the matter.

Not very interested: 7% of the respondents express a low level of interest in studying the features of interaction design. This group indicates a limited interest or preference for other aspects of their college curriculum.

Not interested at all: 5% of the respondents declare no interest whatsoever in studying interaction design features as part of their college curriculum. This represents a smaller but still notable portion of participants who are not inclined toward this subject.

Table 6: interest of the studying the features of interaction design as part of your college curriculum

Interest of the studying the features of interaction design as part of your college curriculum	Percentage
Very interested	58%
Somewhat interested	18%
Neutral	12%
Not very interested	7%
Not interested at all	5%

- **Awareness of the current industry demand for professionals with skills in interaction design**

The statement "Awareness of the current industry demand for professionals with skills in interaction design Percentage" provides insights into the level of awareness among survey respondents regarding the demand for professionals with skills in interaction design within the industry. Here's an interpretation of the provided percentages:

Very aware: 23% of the respondents are highly conscious of the current industry demand for professionals with skills in interaction design. This suggests that a relatively small but significant

portion of participants is well-informed about the demand for these skills. Somewhat aware: 20% of the respondents have a moderate level of awareness. While not as strongly informed as those who are "very aware," this group still recognizes, to some extent, the demand for professionals with interaction design skills in the industry.

Neutral: 35% of the respondents are neutral, indicating that they neither strongly acknowledge nor lack awareness of the industry demand for interaction design skills. This group may not have formed a strong opinion or may be unsure about the current demand. Not very aware: 12% of the respondents have a low level of awareness regarding the industry demand for interaction design skills. This group suggests a limited understanding or acknowledgment of the demand for such skills.

Not aware at all: 10% of the respondents declare no awareness at all regarding the current industry demand for professionals with skills in interaction design. This represents a smaller but still notable portion of participants who are not informed about the demand for these skills.

Table 7: Awareness of the current industry demand for professionals with skills in interaction design

Awareness of the current industry demand for professionals with skills in interaction design	Percentage
Very aware	23%
Somewhat aware	20%
Neutral	35%
Not very aware	12%
Not aware at all	10%

- **Important is interaction design in meeting the demands of today's industries**

The statement "How important is interaction design in meeting the demands of today's industries Percentage" provides insights into the perceived significance of interaction design in addressing the requirements of contemporary industries. Here's an interpretation of the provided percentages:

Yes, frequently: 20% of the respondents believe that interaction design is frequently important in meeting the demands of today's industries. This indicates that a portion of participants strongly recognizes the regular and substantial relevance of interaction design in industry needs.

Yes, occasionally: 23% of the respondents think that interaction design is occasionally important. While not as consistently crucial as the "Yes, frequently" group, this suggests that another segment of participants acknowledges the importance of interaction design but may see it as situational or periodic.

Not sure: 35% of the respondents are unsure about the importance of interaction design in meeting industry demands. This group represents a significant portion of participants who may not have a clear opinion or knowledge on the matter.

No, rarely: 10% of the respondents believe that interaction design is rarely important in meeting industry demands. This suggests a smaller portion of participants who do not see interaction design as a frequent contributor to addressing industry needs.

No, never: 12% of the respondents assert that interaction design is never important in meeting industry demands. This represents another subset of participants who believe that interaction design does not play any role in addressing the demands of today's industries.

Table 8: important is interaction design in meeting the demands of today's industries

Important is interaction design in meeting the demands of today's industries	Percentage
Yes, frequently	20%
Yes, occasionally	23%
Not sure	35%
No, rarely	10%

No, never	12%
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- Pursuing additional training or education in interaction design based on the perceived industry demand**

The statement "Pursuing additional training or education in interaction design based on the perceived industry demand Percentage" provides insights into the likelihood of survey respondents seeking further training or education in interaction design based on their perception of industry demand. Here's an interpretation of the provided percentages:

Very likely: 19% of the respondents express a high likelihood of pursuing additional training or education in interaction design. This suggests that a notable portion of participants is strongly inclined to enhance their skills in interaction design in response to the perceived demand in the industry.

Somewhat likely: 24% of the respondents are somewhat likely to pursue additional training or education. While not as committed as those who are "very likely," this group still indicates a moderate interest in furthering their knowledge and skills in interaction design.

Neutral: 30% of the respondents are neutral, suggesting that they neither strongly lean towards nor against pursuing additional training or education in interaction design based on perceived industry demand. This group may not have formed a decisive opinion or may be unsure about their future educational plans.

Not very likely: 15% of the respondents are not very likely to pursue additional training or education in interaction design. This indicates a portion of participants who are less inclined to invest in further education in this field.

Not likely at all: 12% of the respondents declare that they are not likely at all to pursue additional training or education in interaction design. This represents a smaller but still notable portion of participants who have no intention of seeking further education in this area.

Table 9: pursuing additional training or education in interaction design based on the perceived industry demand

Pursuing additional training or education in interaction design based on the perceived industry demand	Percentage
Very likely	19%
Somewhat likely	24%
Neutral	30%
Not very likely	15%
Not likely at all	12%

- That incorporating interaction design skills into your education will enhance your competitiveness in the job market**

The statement "That incorporating interaction design skills into your education will enhance your competitiveness in the job market Percentage" provides insights into the perceptions of survey respondents regarding the impact of incorporating interaction design skills into their education on their competitiveness in the job market. Here's an interpretation of the provided percentages:

Strongly agree: 15% of the respondents strongly believe that incorporating interaction design skills into their education will significantly enhance their competitiveness in the job market. This suggests that a relatively small but notable portion of participants has a strong positive opinion on the value of interaction design skills in boosting employability.

Agree: 28% of the respondents agree that incorporating interaction design skills will enhance their competitiveness in the job market. This is a larger group that sees the value of such skills in improving their standing in the employment landscape.

Neutral: 25% of the respondents are neutral, indicating that they neither strongly agree nor disagree with the idea that incorporating interaction design skills will enhance their competitiveness. This group may not have a decisive opinion on the matter.

Disagree: 15% of the respondents disagree with the notion that incorporating interaction design skills into their education will enhance their competitiveness. This suggests a portion of participants who do not see a clear connection between these skills and job market competitiveness.

Strongly disagree: 17% of the respondents strongly disagree, indicating a strong negative stance on the belief that interaction design skills will enhance their competitiveness in the job market. This group, though smaller than those who disagree, holds a firm view against this idea.

Table 10: That incorporating interaction design skills into your education will enhance your competitiveness in the job market

That incorporating interaction design skills into your education will enhance your competitiveness in the job market	Percentage
Strongly agree	15%
Agree	28%
Neutral	25%
Disagree	15%
Strongly disagree	17%

Conclusion

The significance of interface design in the field of design education is becoming more and more recognised by this research. Both the quantitative and qualitative data show that students and working professionals are well aware of the need to acquire interface design skills to keep up with business needs. The vast majority agree that these abilities might make one more marketable to prospective employers. But for other responses, the purpose and worth of interface design are still unclear. In order to provide students with the skills that contemporary companies are looking for, the study highlights the urgent necessity to include interaction design ideas into design courses. Schools need to be proactive in making changes to their curricula in order to help students fill skill gaps and provide them an advantage in today's fast-paced job markets.

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