




Research Article

Design Thinking Mindset-Is It a Prerequisite for Academic Performance?

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Abstract

Academic performance (grades and marks in a subject or course) is the basic indicator of student's academic success in most of the cases. The available and relevant literature is in line with this proposition. However, there is almost no literature available which can discuss on the academic performance of students from design thinking perspective which has been recognized as a prerequisite for better placement of students in various organizations. Therefore, the present research is novel attempt to examine the empirical relationship between the dimensions of design thinking mindset and academic performance in a sample of 108 students of a premium business school in India. Data has been collected through survey and a validated questionnaire in addition to the marks obtained by the students in a specific subject (indicator of academic performance). By applying appropriate statistical tests, the findings indicate a mixed kind of results. Implications followed by conclusions have been discussed which can motivate future researchers to extend or replicate the present research in different academic or corporate contexts.

Introduction

Innovation is the new mantra for organizational and individual success (Rosch *et al.*, 2023) which is possible by incorporating the evolving concept of design thinking not only in corporate but also in academia. Gone are the days when corporate sector just looked at academic records of students for selections in management roles (Suhaimi *et al.*, 2024). Now it's time to look for other factors in a student's resume which can justify his/her problem generating and solving skills. This may be the possible reason that has propelled the management institutions of India to focus on

design thinking as part of curriculum (<https://www.iimb.ac.in/sites/default/files/inline-files/Design-Thinking-Management-Higher-Education.pdf>). However, the question is still unanswered i.e., why design thinking? In response to this question, business schools argue that with the increasing importance of innovations in technology, products and services, professionals need design thinking skills (<https://www.insead.edu/executive-education/open-online-programmes/design-thinking-creativity-business>). Moreover, scholars (Figueiredo, 2021; Glen *et al.*, 2015;

Dunne and Martin, 2006). argue that for a long-time management education has been stamped as an obsolete domain of knowledge creation and learning outcomes for academic community and therefore this stamp needs to be removed by making management education innovative and problem centered rather than purely theoretical and bookish one.

As far as the definition of Design thinking is concerned, we do not find any research study in any journal. However, from the web source (<https://www.indeed.com/career-advice/career-development/what-is-design-thinking>)

design thinking can be defined as “*the process of using creative skills to solve problems*”. Now the question is-do all students have creative skills and the answer is yes but they do not normally use it to solve problems especially in the age of AI and Chat-GPT which gives ready-made answer to the most of the problems. So, the next cascading question is –how the design thinking is related with the academic performance of students? At this juncture, it is mandatory to define academic performance of students from scholarly point of view. “*Academic performance has been defined as grade point average which is analogical to the marks obtained in any particular subject by the students*”

(<https://www.sciencedirect.com/topics/psychology/academic-performance>).

Now, if we look into the existing academic systems of business schools in India, we will find that to a great extent the existing pattern of examination focuses on memorization which lacks creative answering by the students which eventually leads to low employability of management students in corporate sector. To improve this situation, many academic institutions have now started to add a course on ‘Design Thinking’ which train the cognitive functioning of students and thereby increases their chances for better career and placement in reputed companies. However, to support or reject this backdrop, we need to explore the available and relevant literature which is as follows.

Literature Review

The ultimate purpose of all kind of management education and functions is to improve the organizational performance which is possible through many ways. However, recent studies show the rising importance of design thinking in corporate which has a cascading effect in education sector as well. For instance, Zafar *et al.* (2023) analyses the concept of design thinking from the perspective of human resources. These researchers have examined a mediation mechanism to explain how human resource (HR) professionals’ design thinking (DT) mindset strengthens the set of training evaluation practices (TEPs) using predictive workforce analytics (PWAs). Similarly, study conducted by Elsbach and Stigliani (2018) indicates the rising influence

of design thinking in organizations from cultural perspective which places it at the core of management subjects such as organizational behaviour, organizational change and organizational development. Sahay (2014) examines the applicability of design thinking from the strategic perspective with emphasis on its applicability in talent acquisition process of the organizations. The researcher argue that the concept of design thinking is not confined to any specific management domain and industry rather it has expanded its wings to many management functions and industries. This may be the possible reason that has compelled many academic institutions to include a full course or a module on design thinking in the curriculum.

The recent scholarly attention is towards design thinking with reference to management education not only in India but across the globe which can be verified through various research contributions (Bathla *et al.*, 2024; Razzouk and Shute, 2012), in the given context. The possible reason for this has been explained in the seminal article by Clark and Smith (2008) wherein it has been emphasized that it is a high time for the management professionals to take leadership roles with special focus on emotional intelligence, integral intelligence, and experiential intelligence which can offer valuable insights for decision making with reference to business outcomes. After reading this seminal article, it can be inferred that in contemporary dynamic business context, most of the business problems cannot be solved through traditional styles of decision making and procedure; rather it requires design thinking mindset which can design the process or a product with high level of innovation and creativity. This view point can be understood from the perspective of constructivist learning theory which has been explained by Guaman-Quintanilla *et al.* (2023) wherein researchers have investigated the effects of using design thinking on students’ problem solving and creativity skills. The study that supports the implementation of design thinking in higher education curriculum for promoting key skills such as problem solving and creativity which are demanded by contemporary employment markets. At this juncture it is worthwhile to note that there could be a non-linear or no relationship between design thinking mindset and academic performance of students which is normally measured in terms of academic grades or marks in a particular subject. Therefore, it becomes important to record some of the available and relevant studies which can shed light on the relationship between academic performance and design thinking mindset of students.

Romero Caballero *et al.* (2024) argue that If the pedagogical approach is based on design thinking learning improves which eventually leads to better academic performance. Although this study is highly relevant for higher education context, it does not explicitly explore the linkage between

design thinking mindset of student and their academic performance. Despite of acknowledging the controversial nature of the subject i.e., design thinking from the academic perspective, Rao *et al.* (2022) have conducted one randomized field experiment amongst school children served by a major non-governmental organization in rural India. The findings of this study reveal that the design thinking training does not just increase confidence but it also increases ideational fluency and elaboration in a divergent thinking task through the original ideas and thoughts. Moreover, this is the first study which has included gender as a variable and found that the increase in confidence occurred primarily among female students as compared to male students. However, again this study is silent on the empirical relationship between design thinking mindset of students and academic performance. In an experimental study conducted by Albay and Eisma (2021), it has been concluded that the implementation of the design thinking process can facilitate teachers in creating a creative, interactive, engaging and learner-centered class room. However, the study is silent on exploring the relationship between design thinking and academic performance of students. According to Cutumisu *et al.*, (2020) “*Design thinking strategies are believed to enhance performance and learning of students but there is no clarity about the relationship between these strategies and learning measured by tests of academic achievement*”. Therefore, more empirical research is required in the given context. In an anticipatory study, Noel and Liu (2016) has been ahead of time and therefore argue that the traditional methods of teaching and curriculum will not serve the purpose of developing 21st century skills such as problem solving and creativity among students. Therefore, there is a requirement of design thinking mindset to be inculcated in the cognitive part of human functioning. Despite of the highly relevant findings, the study is unable to answer the question—is there any empirical relationship between design thinking-mind-set and academic performance of students. With this literary backdrop, the present research is an attempt to fill the research gap i.e., design thinking mindset and its association with academic performance of students.

Hypotheses Development

Examination is a testing mechanism for the academic performance of students which normally includes the questions from the syllabus taught in the class as a subject prescribed in the course. However, in response to rising influence of Bloom Taxonomy, the question papers set for the examinations covers some questions which are application oriented and therefore, unpredictable for the students. Under such circumstances, some students perform better (obtain better marks or grades) and some do not. The students who perform better are those students who can handle uncertainty with their design thinking approach and therefore, remain comfortable with ambiguity which has

been referred as TU as a dimension of design thinking mindset in the validated questionnaire. With this backdrop, the first hypothesis is:

H1: *There is a positive and significant relationship between academic performance and TU.*

Academic performance and enterprising behavior are two different concepts which most of the time do not overlap with each other because enterprising behavior involves risk (dimension of design thinking mindset denoted as ER) which academic performers try to avoid. That may be the reason due to which many academic toppers look for high paying jobs or research careers rather than going for start-ups. With this backdrop, second hypothesis is:

H2: *There is a significant and negative relationship between academic performance and ER.*

Human centeredness (HC) is the third dimension of design thinking mindset which refers to the people side of business. Involving people around you take a lot of time and energy (mental and physical) and therefore, academic performers are not expected to be good in it. So, third hypothesis is:

H3: *There is a significant and negative relationship between academic performance and HC.*

Empathy is the fourth dimension of design thinking mindset which refers to caring people around you which again takes a lot of time and energy which is not possible for academic performers to leverage. Therefore, fourth hypothesis is:

H4: *There is a significant and negative relationship between academic performance and empathy.*

Mindfulness is the fifth dimension of design thinking mindset which refers to the awareness of a process to obtain specific goals in life. When this dimension is realized by the students, they put sincere efforts in their academic process and avoid short-cuts to achieve anything tangible or intangible. Moreover, the presence of mindfulness in the cognitive part of human nature makes him or her a better performer. Therefore, fifth hypothesis is:

H5: *There is a significant and positive relationship between mindfulness and academic performance.*

Holistic view (HV) is the sixth dimension of design thinking mindset which refers to approaching a problem from the broader perspective which results into finding a solution to the problem. When this view is imbibed in student's thought process, they may obtain better grades or marks which eventually converts into academic performance. So, the sixth hypothesis is:

H6: *There is a significant and positive relationship between HV and academic performance.*

Problem reframing (PR) is the seventh dimension of design thinking mindset which refers to human capability to

understand the contextual problem before reaching at solution. It has been experienced by the author of the present research paper that many a times students are not capable to reframe the business problems and as a result unable to find a viable solution. Therefore, it can be assumed that higher the problem reframing capability, higher will be academic performance of students in a business school. So, the seventh hypothesis is:

H7: *There is a significant and positive relationship between PR and academic performance.*

Team knowledge or team work (TW) is 8th dimension of design thinking mindset which refers to propensity of people to understand the team behavior and work accordingly. However, when the academic performance comes in to picture, this team knowledge takes a back seat and people join the race of competition which is natural human tendency. Those who still sail the boat of team are likely to achieve less at individual level as reflected in sports like cricket (Virat Kohli vs. Rohit Sharma). This may also be applicable in academic context where there is always a high level of competition among students. With this backdrop, the 8th hypothesis is:

H8: *There is a significant and negative relationship between TW and academic performance.*

Cross-disciplinary collaborative team (CCT) is the 9th dimension of design thinking mindset which refers to human skills to collaborate outside the departments and organizations to complete the assignment of any project. This unifies the diversified expertise at a single platform resulting into better performance. In other words, the authors of the present study have experienced that when students study in group mode and collaborate with each other in projects, their academic performance increases. So, the 9th hypothesis is:

H9: *There is a significant and positive relationship between CCT and academic performance.*

Open to diversity (OTD) is 10th dimension of design thinking which refers to acceptance of people from diverse skill sets and backgrounds which generates diverse perspective on any significant issue and eventually creates a learning environment where every member of the diversified team learns complementary skills and nurture his or her broad understanding of the subject leading to better performance. With this backdrop, the 10th hypothesis is:

H10: *There is a significant and positive relationship between OTD and academic performance.*

Learning orientation (LO) is 11th dimension of design thinking mindset which refers to continuous learning based on feedback, observations, and experiences. It has been observed that many students think that getting marks in a

specific subject during examination is the terminal point and therefore they stop their learning behavior which restricts their academic performance in subsequent semesters. On the contrary, some students keep the learning journey in progress and relentlessly make efforts to get better academic performance even after the completion of the course such as through executive development programs or trainings received by their respective organizations during job. So, the 11th hypothesis is:

H11: *There is a significant and positive relationship between LO and academic performance.*

Experimentation is a way of human life where people learn new concepts either by successfully conducting the experimentation or through failure. However, there is a very little scope in academic life for experimentation to achieve academic performance and the students who do experiments often face difficulty in maintaining academic performance because of the redundant examination pattern followed by bookish evaluation system in India. Therefore, 12th hypothesis is:

H12: *There is a significant and negative relationship between experimentation and academic performance.*

Experiential intelligence (EI) is 13th dimension of design thinking mindset which refers to hands-on experience wherein students may learn the concepts of any subject deeply and when evaluated in examinations, perform better by emphasizing on practical knowledge subject to the process of examination system followed in a specific university or institute. But in general, Indian education system, this experiential intelligence is undervalued and hence students may not perform better academically. Therefore, 13th hypothesis is:

H13: *There is a significant and negative relationship between EI and academic performance.*

Critical questioning (CQ) is 14th dimension of design thinking mindset which refers to innovative and vigilant behavior of human beings. The people with such kind of attribute may be good researchers and scientists but academically they may not perform which largely depends on bookish knowledge in India. Therefore, 14th hypothesis is:

H14: *There is a significant and negative relationship between CQ and academic performance.*

Abductive thinking (AD) is 15th dimension of design thinking mindset which refers to the explanatory capability of human beings with the limited set of information. With this thought process, people may not perform to the optimal level and hence 14th hypothesis is:

H15: *There is a significant and negative relationship between AD and academic performance of students.*

Envisioning new things (ENT) is 16th dimension of design thinking mindset which refers to having different innovative explanations for a particular outcome which may distract the students from being focused on a specific objective and hence undermine academic performance. So, 16th hypothesis is:

H16: *There is a significant and negative relationship between ENT and academic performance.*

Creative confidence (CC) is 17th dimension of design thinking mindset which refers to ability of students to solve problems creatively which makes them versatile and because of this they may not focus on academic achievements which is often measured in terms of grades or marks. So, 17th hypothesis is:

H17: *There is a significant and negative relationship between CC and academic performance.*

Desire to make a difference (DTMD) is 18th dimension of design thinking mindset which refers to human capability to make positive changes around him or her by creating value to any product or services. The students with such attributes are likely to be better entrepreneurs which may not have necessary association with academic performance of students. So, 18th hypothesis is:

H18: *There is a significant and negative relationship between DTMD and academic performance.*

Optimism is the 19th dimension of design thinking mindset which refers to positive functioning of human cognition and thereby can contribute positively in academic performance of students. So, 19th hypothesis is:

H19: *There is significant and positive relationship between optimism and academic performance.*

Research Methodology

Every research is started with a specific research paradigm which refers to the theoretical or philosophical ground for the research work. It is Kuhn (1962) who first used the word paradigm in the field of research from a philosophical point of view. However, in specific reference to educational research, the term *paradigm* refers to a researcher's 'worldview' (Mackenzie and Knipe, 2006). So, as a researcher we developed our world view around design thinking and antecedents and consequences related with this evolving concept of design thinking. Accordingly, we set the tone for this research starting from introduction and literature review followed by data collection.

Data for design thinking mindset has been collected with the help of validated scale developed by Dosi *et al.* (2018). This scale consists of various dimensions of design thinking mindset such as human centeredness (HC), learning oriented (LO), open to different perspectives/diversity (OTD), Mindfulness etc., which are elaborated in the

section hypotheses development. Initially, 120 students (two sections of 60 students) were given this questionnaire through class room contact and finally 108 questionnaires were returned which were complete in all sense without any missing value. Therefore, the response rate is 90%. So, the usable sample is 108 students pursuing management course from a premium business school in South India. As we are not concerned with any demographical variables, there was no mention about gender and age of students. This data was entered in SPSS software and then marks of a specific subject for all 108 students were recorded in SPSS followed by correlational analysis. For the correlational analysis we have opted *Pearson* coefficient because of normality of data.

Results and Discussions

Table 1 shows that there is a positive relationship between TFU and marks (indicator of academic performance) but this relationship is insignificant which may be due to response bias or small sample size. Therefore, H1 is partially accepted which means that the students who can handle uncertainty with their design thinking approach can perform in academics as compared to those who are unable to handle uncertain situations in their professional life. This result suggest that management students' needs to be trained for handling with uncertain situations on and off the university or institutional campuses.

Table 1: Correlations between TFU and marks

		TFU	Marks
TFU	Pearson Correlation	1	.051
	Sig. (2-tailed)		.597
	N	108	108
Marks	Pearson Correlation	.051	1
	Sig. (2-tailed)	.597	
	N	108	108

Table 2 indicate that there is a negative relationship between marks and enterprising risk taken by academic performers. Although, this result is in line with the proposed hypothesis H2 but it is insignificant which may be due to small sample or response bias. Therefore, H2 is partially accepted. This result clearly shows that students who are good in academics are less inclined towards establishing their enterprises and therefore recruiters are suggested to select these kinds of students for different job roles. On the contrary, if the recruiters will select the students who are enterprising, may lose the talented human resources within a short span of time which will eventually impact the human capital cost of the recruiter's organizations.

Table 2: Correlations between marks and enterprising risk

		Marks	ER
Marks	Pearson Correlation	1	-.099
	Sig. (2-tailed)		.308
	N	108	108
ER	Pearson Correlation	-.099	1
	Sig. (2-tailed)	.308	
	N	108	108

From Table 3, it is evident that there is a significant and negative relationship between human centeredness and marks (indicator of academic performance, which is in line with the proposed hypothesis H3. Therefore, H3 is accepted. Although the value of correlation coefficient is low, it suggests that academic performers are not concerned with the people around them and thereby may not be good for the job roles that requires caring for other members in the team. Such kind of students should be avoided for leadership positions in the organizational context.

Table 3: Correlations between Marks and HC

		Marks	HC
Marks	Pearson Correlation	1	-.288**
	Sig. (2-tailed)		.003
	N	108	108
HC	Pearson Correlation	-.288**	1
	Sig. (2-tailed)	.003	
	N	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

From Table 4, it is evident that there is a significant and negative relationship between empathy and academic performance (marks) in the given sample, which is in line with the proposed hypothesis H4. So, H4 is accepted. Moreover, it can be inferred that the students who do not have empathy may be good for junior level job roles requiring individualistic attitude but not suitable for team level roles.

Table 4: Correlations between Marks and Empathy

		Marks	Empathy
Marks	Pearson Correlation	1	-.200*
	Sig. (2-tailed)		.038
	N	108	108
Empathy	Pearson Correlation	-.200*	1
	Sig. (2-tailed)	.038	
	N	108	108

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5 shows that there is negative and insignificant relationship between mindfulness and marks which is not in line with the proposed hypothesis. So, H5 is rejected. The possible reason may be that in contemporary time, students are capable to gain marks in the examination but they are not aware about their psychological states of mind. As a result, these students are unable to gain insights into their

personality traits which restricts them to get leadership positions in the organizations.

Table 5: Correlations between Marks and Mindfulness

		Marks	Mindfulness
Marks	Pearson Correlation	1	-.162
	Sig. (2-tailed)		.095
	N	108	108
Mindfulness	Pearson Correlation	-.162	1
	Sig. (2-tailed)	.095	
	N	108	108

Table 6 shows that there is insignificant and negative relationship between academic performance and holistic view dimension of design thinking which is not in line with the proposed hypothesis H6. So, H6 is rejected. The result confirms that in contemporary academic scenario students may perform academically but they lack to visualize the holistic view of the world and hence, in the increasing space of internationalization, they are likely to fail as a professional.

Table 6: Correlations between Marks and HV

		Marks	HV
Marks	Pearson Correlation	1	-.006
	Sig. (2-tailed)		.947
	N	108	108
HV	Pearson Correlation	-.006	1
	Sig. (2-tailed)	.947	
	N	108	108

From Table 7, it is evident that there is significant negative relationship between problem reframing (PR) and academic performance. This result is not in line with the proposed hypothesis H7. So, H7 is rejected. Moreover, this result is very alarming for Indian education system especially for management education because it shows that the management students in India are not able to reframe the business problems. Therefore, stakeholders are required to take serious decisions regarding the existing pedagogical methods and evaluation parameters in business schools.

Table 7: Correlations between Marks and PR

		Marks	PR
Marks	Pearson Correlation	1	-.142
	Sig. (2-tailed)		.142
	N	108	108
PR	Pearson Correlation	-.142	1
	Sig. (2-tailed)	.142	
	N	108	108

Table 8 indicates significant and negative relationship between TW (Team Work) and academic performance (marks) which is in line with the proposed hypothesis H8. So, H8 is accepted. This result is highly visible in many management institutions wherein students compete with

each other for getting marks at the cost of team spirit which in one sense is good but in other sense not good for corporate life wherein team work is highly appreciated. Therefore, faculty members should think carefully for designing the team-based assignment and projects so that a student remain competitive and at the same time he or she remain a good team player.

Table 8: Correlations between Marks and TW

		Marks	TW
Marks	Pearson Correlation	1	-.199*
	Sig. (2-tailed)		.039
	N	108	108
TW	Pearson Correlation	-.199*	1
	Sig. (2-tailed)	.039	
	N	108	108

*, Correlation is significant at the 0.05 level (2-tailed).

Table 9 shows negative and insignificant relationship between academic performance and CCT (cross-disciplinary collaborative team) which is not in line with the proposed hypothesis H9. So, H9 is rejected. The possible reason for such kind of result may be that the management students assumes that they should not collaborate with other functional domains (HR, Marketing, Finance etc.) because they want academic specialization in only one or maximum two domains. However, the corporate reality is very different which requires understanding the business problems not from the perspective of any specific domain, rather it requires understanding the business problem as a whole. In the light of this result academic leaders should think to remove the barriers of specialization in management courses and vet for more generalized course which can train the students holistically.

Table 9: Correlations between Marks and CCT

		Marks	CCT
Marks	Pearson Correlation	1	-.117
	Sig. (2-tailed)		.228
	N	108	108
CCT	Pearson Correlation	-.117	1
	Sig. (2-tailed)	.228	
	N	108	108

Table 10 demonstrate that there is negative and insignificant relationship between academic performance and OTD (open to diversity) which is not in line with the proposed hypothesis. Hence, H10 is rejected. The plausible reason for the result can be understood from the narrow perspective of sampled students who are unaware about external world (due to their non-interactions with other students in the country) which requires diversity and inclusion in academic or non-academic organizations. Therefore, educational leaders of various universities and academic organizations

are required to consider this issue from admission perspective where they can bring diversity in the classes so that apart from academic performance, students can understand the value of regional and cultural diversity at the future workplace.

Table 10: Correlations between Marks and OTD

		Marks	OTD
Marks	Pearson Correlation	1	-.174
	Sig. (2-tailed)		.071
	N	108	108
OTD	Pearson Correlation	-.174	1
	Sig. (2-tailed)	.071	
	N	108	108

Table 11 reveals that there is insignificant and negative relationship between academic performance and LO (learning orientation) which is not in line with the proposed hypothesis. So, H11 is rejected. This result warns the academic stakeholders to design the academic system in such a way that students not only focus on academic performance at a specific point of time such as semester or trimester rather they develop the habit of continuous learning leading to learning orientation and academic performance even at executive level of management education.

Table 11: Correlations between Marks and LO

		Marks	LO
Marks	Pearson Correlation	1	-.019
	Sig. (2-tailed)		.843
	N	108	108
LO	Pearson Correlation	-.019	1
	Sig. (2-tailed)	.843	
	N	108	108

Table 12 shows that there is insignificant and positive relationship between academic performance and experimentation (design thinking dimension) which is not in line with the proposed hypothesis H12. Therefore, H12 is rejected. This result shows that the students who believe in experiments develop practical understanding of the subject and therefore better in examinations leading to better marks. However, such kind of results are contingent upon the evaluation system and evaluator's thought process during evaluating any answer. At this point, it is suggested that evaluators should extend their cognitive boundaries beyond bookish knowledge and give emphasis on innovative and practical answers given by the students for a specific course during evaluation.

Table 12: Correlations between Marks and Experimentation

	Marks	Experimentation
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Marks	Pearson Correlation	1	.141
	Sig. (2-tailed)		.145
	N	108	108
	Pearson Correlation	.141	1
	Sig. (2-tailed)	.145	
Experimentation	N	108	108

Table 13 depicts that there is insignificant and positive relationship between academic performance and experiential intelligence (EI) which is the dimension of design thinking mindset. This result is not in line with the proposed hypothesis H13, so, H13 is rejected. It means that the students who have hands-on-experience on a specific subject matter are likely to perform better. So, the educationists are suggested to leverage the advantage of experiential teaching methods so that students can learn practical intricacies of the subject and eventually become corporate-ready professional.

Table 13: Correlations between Marks and EI

		Marks	EI
Marks	Pearson Correlation	1	.030
	Sig. (2-tailed)		.756
	N	108	108
EI	Pearson Correlation	.030	1
	Sig. (2-tailed)	.756	
	N	108	108

From Table 14, it is evident that there is insignificant and negative relationship between academic performance and critical questioning (CQ) of students which indicates innovative behaviour of students in the class or out of the class conversation between faculty and students. This result is in line with the proposed hypothesis H14. So, H14 is accepted. This is a very surprising result which indicates that the students who are innovative and believes in critical questioning are unable to perform academically. That may be the possible reason due to which we find discrepancies between the placement of an innovative student and academic performer's placement for various kind of job roles either through campus or off-campus.

Table 15 indicates that there is insignificant and positive relationship between academic performance and abductive thinking (AD) which refers to explanatory capability of human beings with the limited set of information This result is not in line with the proposed hypothesis and therefore H15 is rejected. However, if we note the contemporary trend of academia we will find that in present days students are not liking to read any full book on a specific subject matter and they are simply dependent on PPTs given by faculty members or short-cut notes prepared during the

class leading to limited information for answering the questions asked in the examination. Moreover, we can also record that in the answers given by the students, there is very little evidence of innovative thoughts and contemporary examples. This may be the possible reason that most of the management students are not employable by the corporate and hence the concept of six-month internship has become the trend before placement of management students.

Table 14: Correlations between Marks and CQ

		Marks	CQ
Marks	Pearson Correlation	1	-.113
	Sig. (2-tailed)		.246
	N	108	108
CQ	Pearson Correlation	-.113	1
	Sig. (2-tailed)	.246	
	N	108	108

Table 15: Correlations between Marks and AD

		Marks	AD
Marks	Pearson Correlation	1	.033
	Sig. (2-tailed)		.737
	N	108	108
AD	Pearson Correlation	.033	1
	Sig. (2-tailed)	.737	
	N	108	108

From Table 16, it is visible that there is insignificant and negative relationship between academic performance and envisioning new things (ENT) and this result is partially in line with the proposed hypothesis H16. Therefore, H16 is partially accepted. The result shows that academic performance is not dependent on the innovative explanations for any specific business outcome rather it depends on traditional explanations which are related to human resources, marketing, finance and other domains of management. This may be the possible reason that has given momentum to the courses like business and HR analytics which can explain the reason for business outcome innovatively on the basis of data.

Table 16: Correlations between Marks and ENT

		Marks	ENT
Marks	Pearson Correlation	1	-.118
	Sig. (2-tailed)		.225
	N	108	108
ENT	Pearson Correlation	-.118	1
	Sig. (2-tailed)	.225	
	N	108	108

Table 17 shows that there is insignificant and positive relationship between academic performance and creative confidence which is not in line with the proposed hypothesis H17. So, H17 is rejected. Therefore, we can infer that the

students who perform better in academics are likely to have better creativity and hence such kind of students are suitable for the job roles which requires creativity as a priority.

Table 17: Correlations between Marks and CC

		Marks	CC
Marks	Pearson Correlation	1	.112
	Sig. (2-tailed)		.246
	N	108	108
CC	Pearson Correlation	.112	1
	Sig. (2-tailed)	.246	
	N	108	108

Table 18 shows that there is significant and negative relationship between academic performance and desire to make a difference which is in line with the proposed hypothesis H18. So, H 18 is accepted. From this result it can be deduced that the students who perform better in academics are less inclined to make a difference either in their organization or in society. So, such kind of students lack social sensitivity and therefore may not be suitable for leadership positions in their corporate journey.

Table 18: Correlations between Marks and DTMD

		Marks	DTMD
Marks	Pearson Correlation	1	-.219*
	Sig. (2-tailed)		.023
	N	108	108
DTMD	Pearson Correlation	-.219*	1
	Sig. (2-tailed)	.023	
	N	108	108

*. Correlation is significant at the 0.05 level (2-tailed).

Table 19: Correlations between Marks and Optimism

		Marks	Optimism
Marks	Pearson Correlation	1	-.017
	Sig. (2-tailed)		.861
	N	108	108
Optimism	Pearson Correlation	-.017	1
	Sig. (2-tailed)	.861	
	N	108	108

Finally, Table 19 shows that there is insignificant and negative relationship between academic performance and optimism which is not in line with the proposed hypothesis H19. So, H19 is rejected. The possible reason for such kind of result may be understood from the perspective of student's desire to be consistent in academic performance and when this consistency is perceived to be weak, the student may lose the hope for performance. This context is visible very frequently in coaching cities like Kanpur, Kota, Lucknow etc., wherein students become less optimistic when they are unable to perform consistently.

Implications

Many times, we decipher the cases related to the selection of a student who is mediocre during placement seasons of business schools and some of the students who score high

marks in academics face difficulty in placement. In such situations we are unable to understand the exact selection criteria adopted by recruiters. However, if we go deep in the context we will realize that the students who are mediocre in academics but may be better in problem solving, innovation which cumulatively leads to design thinking mindset of students and this mindset may be the single predictor of his/her selection. This was the basic reason for which we as a researcher wanted to know the empirical relationship between design thinking mindset and academic performance of management students.

Results confirms that design thinking mindset may not be a prerequisite for academic performance. Therefore, recruiters are suggested to go an extra mile in selecting students for various roles during placement interviews which is independent of design thinking mindset. This result may contribute to the contextual discourse by looking at the design thinking trajectory (Johansson-Sköldber *et al.*, 2013) which explain the evolutionary phases, present context and future directions for design thinkers. Moreover, despite of long history of academic development, the concept of design thinking has not come to its acceptance by most of the stakeholders and hence there is a long way to go if we want to nurture our future management professionals with design thinking mindset which is prerequisite for academic performance.

Conclusions

Academic performance (grades and marks in a subject or course) is the basic indicator of student's academic success in most of the cases. The available and relevant literature is in line with this proposition. However, there is almost no literature available which can discuss on the academic performance of students from design thinking perspective which has been recognized as a prerequisite for better placement of students in various organizations. Therefore, the present research is novel attempt to examine the empirical relationship between the dimensions of design thinking mindset and academic performance in a sample of 108 students of a premium business school in India. Data has been collected through survey and a validated questionnaire in addition to the marks obtained by the students in a specific subject (indicator of academic performance). By applying appropriate statistical tests, the findings indicate a mixed kind of results. Moreover, the results open the new avenues for academic institutions and universities to organize more training programs and workshops for students related to design thinking. Implications followed by conclusions have been discussed which can motivate future researchers to extend or replicate the present research in different academic or corporate contexts.

Authors' Contribution

Both the Authors have contributed equally in completing this research article.

Conflict of Interest

Authors declare no conflict of the present publication.

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