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No silver bullet for online Survey Response Propensity: evidence from Saudi faculty and graduate students

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Survey methodology in higher education represents a cornerstone of educational research, with survey participation metrics serving as a key indicator of methodological rigor and validity. This study investigated the factors influencing self-reported response propensity among faculty members and graduate students within a Saudi higher-education context. Using a cross-sectional design, data were collected through a web-based questionnaire from 112 participants, including 41 faculty members and 71 graduate students from the College of Education. Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 3.0 was employed to evaluate both measurement and structural models. The results indicated that all design-related factors significantly and positively influenced the likelihood of responding to online academic surveys. Among these factors, Authority/Belonging exerted the strongest effect on response propensity ($f^2 = 2.109$), followed by Reminders/Advance Notice ($f^2 = 1.049$), Ethical Issues ($f^2 = 0.934$), Survey Structure ($f^2 = 0.815$), and Motivation/Incentives ($f^2 = 0.735$). These findings highlight the pivotal role of credibility cues, ethical transparency, and structured follow-up strategies in enhancing response propensity. The findings highlight the role of credibility cues, ethical transparency, and follow-up strategies in shaping response propensity within this institutional setting.

KEYWORDS

higher education, online survey methodology, PLS-SEM, Saudi Arabia, Survey Response Propensity

1 Introduction

Survey methodology in higher education constitutes an essential component of educational research, with survey response rates serving as a pivotal indicator of methodological rigor and validity, as low response rates may introduce bias and compromise the generalizability of findings (Klingwort and Toepoel, 2025). Higher education plays a critical role in national development, particularly within the context of Saudi Arabia's Vision 2030, which emphasizes educational reform, innovation, and accountability (Zahrán, 2023; Almutair and Almutair, 2022). In this rapidly evolving environment, understanding the factors that influence survey participation among educators and students is crucial for generating reliable evidence to guide policy and practice (Saleh and Bista, 2017; Taherdoost and Madanchian, 2025). Survey response rates among faculty members and graduate students thus represent a vital aspect of educational research, providing insights into the effectiveness of academic programs, institutional strategies, and graduate outcomes (Almutair and Almutair, 2022).

In the Saudi context, faculty members and graduates represent distinct yet interrelated groups within higher education. Faculty members, who balance teaching, research, and administrative roles, may vary in their perception of survey relevance depending on their academic discipline or institutional affiliation. Graduates, by contrast, form a heterogeneous group with diverse academic experiences and professional trajectories, shaping their willingness to share feedback on program quality, skill alignment, and employability (Zahran, 2023). These differences highlight the need to explore the psychosocial and structural factors that shape survey response behavior in higher education settings.

Several factors have been identified as influential in determining survey response rates, including the clarity of survey objectives, the design and distribution methods, and the assurance of confidentiality and data security (Saleh and Bista, 2017). Institutional culture and the prevailing norms of academic communication may also encourage or discourage participation (Hendra and Hill, 2018). In recent years, the integration of digital platforms has become increasingly important, particularly as younger participants—such as graduate students—are more accustomed to online interaction (Holtom et al., 2022). However, in many contexts, including Saudi Arabia, concerns about data privacy, institutional authority, and trust in research sponsorship can significantly shape engagement levels.

Examining survey response behavior among Saudi faculty and graduate students therefore offers valuable insights into institutional effectiveness, academic program quality, and alignment with labor market needs (Zahran, 2023). Understanding these factors supports evidence-based decision-making and fosters a culture of continuous improvement in higher education, ultimately benefiting students, educators, and the wider academic community (Almutair and Almutair, 2022). Given the ongoing transformation of the Saudi higher education system, the importance of achieving robust response propensity in academic surveys is likely to increase, emphasizing the need for strategic and contextually sensitive approaches that enhance participation among key stakeholders.

Despite this importance, empirical research on the factors of survey response rates within Saudi higher education remains limited. Faculty and graduate students frequently serve as primary target groups for academic surveys, yet their participation is often characterized by low engagement and declining response rates. Observations during the present research process revealed patterns of reluctance among both groups: faculty members appeared unmotivated to respond to surveys despite awareness of their academic significance, while graduate students exhibited hesitation to complete online questionnaires, particularly in the absence of a recognized institutional authority. Such reluctance may stem from concerns about cybersecurity, data misuse, or a lack of perceived relevance. Moreover, despite employing several design-based improvements, including clear instructions and user-friendly layouts, the observed response rates remained unsatisfactory. These trends suggest that factors beyond technical design—such as perceptions of authority and belonging, ethical trust, motivation, and communication strategies—may be critical factors of participation (Hossan et al., 2023).

To address these gaps, this study focuses on faculty members and graduate students as the central units of analysis and explores the influence of five design-related factors—Authority/Belonging, Reminders/Advance Notice, Ethical Issues, Survey Structure, and

Motivation/Incentives—on response behavior. Furthermore, survey timing was examined descriptively to yield contextual insights into participants' desired completion intervals and deadlines, so providing a realistic enhancement to the modeled components. Accordingly, the study sought to examine the subsequent research questions:

RQ1: To what degree do the five design-related factors—Authority/Belonging, Reminders/Advance Notice, Ethical Issues, Survey Structure, and Motivation/Incentives— influence faculty and graduates' Survey Response Propensity?

RQ2: Do participants' demographic variables (gender, age, and academic position) are associated with differences in faculty and graduates' Survey Response Propensity?

RQ3: What descriptive trends can be identified concerning faculty and graduates' preferences for the Survey Timing?

This study is grounded in Dillman et al. (2014) Tailored Design Method (TDM), which provides a comprehensive framework for understanding and enhancing survey participation, particularly in digital contexts. Rooted in Social Exchange Theory, TDM posits that individuals are more likely to participate in a survey when they perceive the benefits of participation as outweighing the associated costs and when trust in the researcher or sponsoring institution is established (Dillman et al., 2014). The approach emphasizes three principles: increasing the perceived value of participation, reducing respondent effort, and strengthening trust through ethical and transparent communication. Within this framework, the five focal factors of the current study correspond directly to Dillman's principles. *Authority/Belonging* reflects perceived institutional credibility and researcher trustworthiness; *Survey Structure* ensures clarity and accessibility; *Ethical Issues* enhance transparency and confidentiality; *Motivation/Incentives* address perceived benefits of participation; and *Reminders/Advance Notice* serve as follow-up mechanisms to sustain engagement. Together, these dimensions provide a theoretically grounded model for examining the factors of Survey Response Propensity among faculty and graduate participants in Saudi higher education.

Although Lavidas et al. (2022) identified six dimensions influencing online survey participation, the current study focused on five theoretically testable factors—Authority/Belonging, Reminders/Advance Notice, Ethical Issues, Survey Structure, and Motivation/Incentives.

The sixth factor, Survey Timing, was analyzed only descriptively because it focused on identifying the best time to reach participants and sending reminders was therefore not suitable for hypothesis testing within the study's model. Including it descriptively allowed the study to capture temporal participation trends while maintaining analytical coherence with the TMD (Dillman et al., 2014).

2 Literature review

Survey is essential for data collection in multiple domains, including education, health, agriculture, and social sciences (McKibben et al., 2025; Klingwort and Toepoel, 2025). The validity of these surveys is significantly affected by the representativeness of the

sample studied (Maliković and Tončić, 2021). Factors that undermine sample representativeness directly affect the generalizability of the research findings (Lavidas et al., 2022). Therefore, determining effective techniques to mitigate low response rates is a subject that requires continuous examination (Klingwort and Toepoel, 2025).

2.1 Survey design and methodological factors

Previous studies have identified key factors affecting response rates, and various procedures and techniques to improve participation from the target sample are examined. Enhancing response rates will ensure that the findings more properly represent the wider community, hence reinforcing the validity and relevance of the results (Schmidt et al., 2025; Taherdoost and Madanchian, 2025). Recent literature across multiple disciplines indicates a tendency of fluctuating, and sometimes diminishing, response rates for numerous large-scale and minor survey research. This drop is apparent across many group characteristics such as patients versus professionals, instructors versus college students or male versus female (Koskey et al., 2015; Lavidas et al., 2022; McKibben et al., 2025), survey methodologies including paper, web, and mixed techniques, and contextual influences such as the impact of the epidemic (Petrovčić et al., 2016; Saleh and Bista, 2017; Daikeler et al., 2020; Ward and Edwards, 2021; Gummer et al., 2021; Lavidas et al., 2022; Schmidt et al., 2025; Taherdoost and Madanchian, 2025). Numerous extensive studies emphasize that response rates remain a vital metric of survey quality and rigor, while also indicating that expectations should be contextualized within the survey's design and objectives for representation (Maliković and Tončić, 2021; Klingwort and Toepoel, 2025). In addition, the most recent research not only validates the best practices that have been established, but it also presents novel issues that are relevant to the virtual setting (Petrovčić et al., 2016; Lavidas et al., 2022). Scholars concur that a singular solution is inadequate; rather, a comprehensive strategy proves to be the most effective approach like the use of mixed-mode survey designs when applicable (Daikeler et al., 2020; Schmidt et al., 2025). Key recommendations include the implementation of personalized and transparent communication strategies (Maliković and Tončić, 2021; McKibben et al., 2025), the provision of unconditional pre-paid monetary incentives whenever feasible (Ward and Edwards, 2021; Gummer et al., 2021), and the careful reduction of technical and survey fatigue through optimized survey design (Saleh and Bista, 2017; Klingwort and Toepoel, 2025).

In a meta-analysis, Daikeler et al. (2020) revealed that mixed-mode surveys (e.g., mail and web) consistently outperform single-mode web surveys. Due of their potential to reach more people, including those without internet connection or digital literacy. To support this, Schmidt et al. (2025) examined mixed-mode design mechanisms. They found that supplying a supplementary medium (like paper) following a web nonresponse helps reclaim a considerable amount of the sample. Meeting participants via their preferred communication method reduces their burden.

Saleh and Bista (2017) found that two or three strategically scheduled reminders—an initial invitation and two or three follow-ups—maximized response on timeliness and substance. They also found that modifying reminder email subject lines engages

ignored recipients. A survey pre-notification email prepares participants and legitimizes the offer. Compared to generic invitations, Petrovčić et al. (2016), found that personalized invitation text with recipient names enhanced survey response rates. Most crucially, their research stressed the need of transparency: clearly expressing the survey's aim, projected time, and data use and protection increased confidence and participation. Moreover, Ward and Edwards (2021) found that monetary incentives, even small, unconditional pre-paid incentives, outperform promised or non-monetary alternatives. Increasingly important is survey salience—the recipient's personal relevance to the topic. Gummer et al. (2021) found that respondents prefer engaging or career-relevant questionnaires. Thus, emphasizing the survey invitation's relevance to the target group might enhance response at affordable expense.

The cognitive and time burden of questionnaires deters. A recent study by Maliković and Tončić (2021) highlights user-centered design including duration and progress indicators and mobile Optimization. Complex longitudinal studies demand lengthier surveys, while shorter ones with progress indications (e.g., “you are almost done! Or you are 80% done!”) can manage respondent expectations and reduce desertion (Maliković and Tončić, 2021). Since most emails are opened on mobile devices, a non-mobile-friendly survey design is cumbersome. Comprehensive smartphone and tablet survey testing is advised. An unpleasant mobile experience increases survey dropout rates, especially early on.

Lavidas et al. (2022), using cross-sectional study, they explored why teachers often show low participation rates in web-based surveys. The study focuses on Greek teachers ($n = 263$) to identify factors influencing their willingness to respond to web surveys. The study's central goal is to determine which factors most strongly influence teachers' intentions to participate in online surveys. The researchers examine six key dimensions derived from prior literature: Authority/Belonging (survey sponsorship), Motivation/Incentives, Survey Structure (form or design), Ethical Issues, Reminders/Advance Notice, and Survey Timing (preferred time). The study also highlights that teachers' increased digital familiarity post-pandemic may enhance engagement with online surveys.

2.2 Demographic factors

Various factors such as survey design, incentives, and timing are well established in the literature as significantly influence Survey Response Propensity (McKibben et al., 2025; Klingwort and Toepoel, 2025). The literature has likewise emphasized demographic characteristics and its placement in the survey. For instance, Ericson et al. (2023), looked at graduate-level medical and allied health students and emphasized factors for high response rates. According to their findings, improving response rates required being sensitive to timing (in order to minimize survey exhaustion), and employing follow-up strategies that were both innovative and persistent. Furthermore, Ziegenfuss et al. (2021) experiment assessed whether including demographic questions in a survey affected overall response rates. They found that demographic items did not negatively impact response rate and that respondents' self-reports aligned well with administrative records.

In a 15 years study by Kolaja et al. (2023), they found that higher educational attainment, being married, female sex, older age, and

non-Hispanic White race/ethnicity were positively associated with survey follow-up response among US military personnel. Similarly, in their large-scale study, Jildeh et al. (2021) found that age significantly influence response rate and response behavior in outcome questionnaires; older participants were much more likely to respond. Moreover, Saleh and Bista (2017) looked at academic researchers (students and faculty) as respondents and found that older participants and male participants had higher response rates when reminders or incentives were used. It was observed by Lavidas et al. (2022) that demographic factors such sex, age group, level of education, and research experience did not show statistically significant associations with intention to participate with a sample of Greek teachers. Likewise, McKibben et al. (2025) found no gender or academic position effect on agricultural instructors' survey response rates. The study demonstrates that researcher-practitioner connections are worsening, emphasizing the need for meaningful collaboration and access researchers should design brief, relevant surveys, strategically target participants, and provide valuable data.

Collectively, the reviewed studies underscore that survey participation is influenced by an interplay of methodological, psychosocial, and demographic variables. However, empirical investigations within the Saudi higher education context remain scarce. There is limited understanding of how factors like authority, ethical trust, and motivation operate among faculty and graduate students in digital survey environments. This gap justifies the current study's focus on applying Dillman's TDM framework to identify determinants of survey response behavior in Saudi universities.

3 Method

3.1 Research design

This research utilized a cross-sectional, quantitative survey methodology based on Dillman et al. (2014) TDM and Social Exchange Theory, which highlights the right balance of security, efforts, and perceived reward in fostering involvement. Structural equation modeling (SEM) employing the partial least squares method (PLS-SEM) was utilized to examine the proposed correlations between design-related variables and survey response behavior.

3.2 Participants and sampling

The requirement for inclusion was being a current student or a current faculty member at college of education. According to the recent statistics from the university's 2024–2025 academic year, the college of education has 183 faculty members and 780 graduate students enrolled in various graduate programs (King Faisal University, n.d.). Consequently, the random sampling was stratified to ensure representation of the two groups. A sample of 125 faculty members and 258 graduate students were selected using the Raosoft sampling calculator¹ to ensure a representative sample for each population. The

response rates were satisfactory for this study's topic and goal, with $n = 41$ faculty and $n = 71$ graduates responding, 33 and 28%, respectively (Carley-Baxter et al., 2013; Price et al., 2022). Table 1 presents the demographic composition of the sample ($n = 112$).

3.3 Instrument and measure

Data collection was conducted during 2024–2025 academic year utilizing the Web-Survey scale by Lavidas et al. (2022). To enhance response propensity, Lavidas et al. (2022) incorporated and scientifically validated six key characteristics of online survey participation (Authority/Affiliation, Motivation/Incentives, Survey Structure, Ethical Issues, Reminders/Advance Notice, and Survey Timing). Items of the questionnaire developed from previous validated studies (e.g., Saleh and Bista, 2017) and evaluated in collaboration with educators. It pertains to teachers attitudes, timing constraints, and trust concerns, rendering it pertinent to our sample of faculty and graduate students in college of education. The questionnaire underwent expert validation, pilot testing, and test-retest reliability assessments, proving it applicable in several cultures and contexts with minor modifications. The questionnaire contained 31 closed-ended items measured on a four-point Likert scale (Strongly Disagree, Disagree, Agree, Strongly Agree). The dependent variable termed 'Survey Response Rate' denotes respondents' self-reported probability of engaging in online surveys, rather than an empirically measured response rate. Consequently, it is construed as a perceptual indicator of response propensity.

3.4 Procedures

To reach as much as possible of faculty and graduates, the link for the online survey was sent through WhatsApp groups as well as in person using QR codes during working days at evening time where graduate courses took place across departments. The subjects were informed about the voluntary participation, aim of the study, and the freedom to withdraw at any time.

TABLE 1 Sample characteristics.

Category	N	%
Gender		
Male	38	33.9
Female	74	66.1
Total	112	100
Age		
From 20 to 40 years	86	76.8
More than 40 Years	26	23.2
Total	112	100
Academic position		
Faculty member	41	36.6
Graduate student	71	63.4
Total	112	100

¹ <http://www.raosoft.com/samplesize.html>

3.5 Ethical consideration

Before carrying out the data collection, the study plan was endorsed and scrutinized by the Research Ethics Committee to prevent any infringement of ethical standards for research involving human subjects (KFU-REC-2024-MAY-ETHICS2271).

3.6 Data analysis

SPSS-22 was used for data coding and preliminary screening procedures, including assessments of missing data, outliers, and multicollinearity. In addition to the five-core factors included in the structural model. The sixth construct—Time Preference—was evaluated descriptively to capture respondents’ availability and preferred timing for survey participation. Subsequently, the measurement and structural models were analyzed using (PLS-SEM) via SmartPLS 3.0. The PLS-SEM was deemed appropriate for this study due to its ability to accommodate non-normal data, smaller sample sizes, and varied measurement scales, offering increased flexibility compared to the stricter requirements of covariance-based SEM (Hair et al., 2022).

3.7 Common method bias

Common method bias (CMB) appears to pose a significant challenge to behavioral research since the subjects have little question that all behaviors have been self-reported and unanimously related (Podsakoff et al., 2024). Bias on the validity and efficiency of the instrument can be observed by the CMB. Harman single factor tests were applied to the data using SPSS. Results showed that the first

component of the matrix showed 29.62% of the variance, however, a total of 15 factors were obtained from the data. The cumulative percentage of the variance of all factors was 63.05%. Table 2 shows the values of all 15 factors and their variance. Previous research suggests that the primary factor should account for no more than 50% of the variance. Despite the fulfillment of this criteria, Harman’s single-factor test serves as a limited diagnostic tool, and the existence of certain CBM cannot be conclusively excluded.

3.8 Reliability analysis

The internal consistency estimates, including Cronbach’s alpha and Composite Reliability, are influenced by the number of items within each scale or sub-dimension. In general, reliability coefficients between 0.60 and 0.70 may be considered acceptable for early-stage or exploratory research, whereas values above 0.80 indicate good internal consistency (Hair et al., 2022). The reliability coefficients for the main scale and its sub-dimensions are presented in Table 3.

4 Results

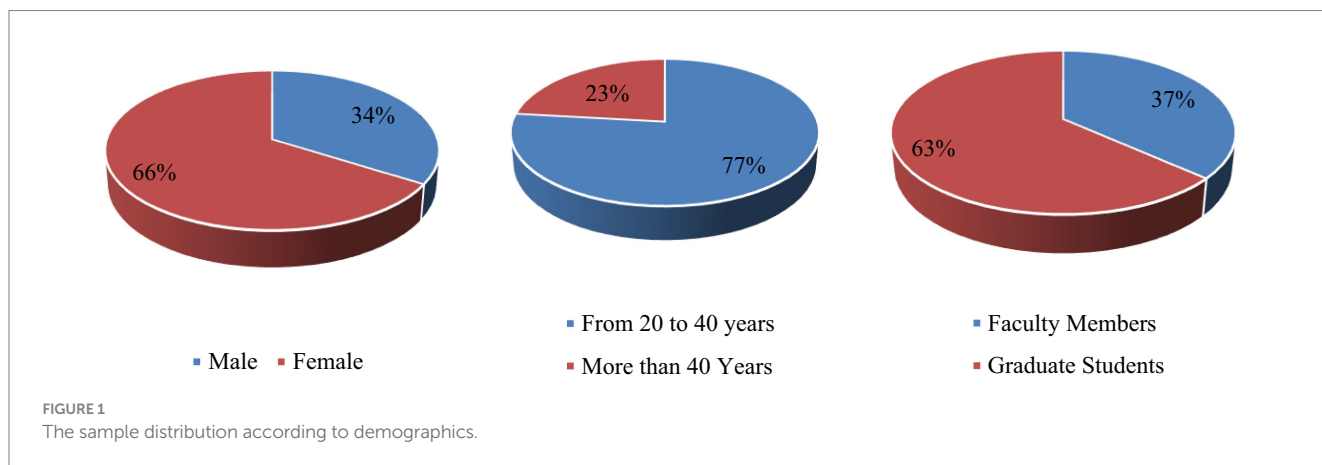
This section delineates the study findings in three segments, along with the research questions. The initial section presents the preliminary analyses, encompassing the demographic characteristics of the sample, participants’ responses concerning the sixth factor (Survey Timing), and the evaluation of multivariate normality. The second section delineates the assessment of the measurement model for the five primary constructs—Authority/Belonging, Reminders/Advance Notice, Ethical Issues, Survey Structure, and Motivation/Incentives—and evaluates their reliability, convergent validity, and

TABLE 2 Common method bias result from EFA.

Component	Total variance explained					
	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.813	29.621	29.621	6.813	29.621	29.621
2	2.077	9.031	38.656	2.077	9.031	38.656
3	1.708	7.427	46.079	1.708	7.427	46.079
4	1.478	6.425	52.504	1.478	6.425	52.504
5	1.323	5.752	58.256	1.323	5.752	58.256
6	1.104	4.798	63.054	1.104	4.798	63.054
7	0.951	4.137	67.191			
8	0.877	3.815	71.006			
9	0.751	3.266	74.272			
10	0.728	3.165	77.437			
11	0.660	2.870	80.307			
12	0.600	2.611	82.918			
13	0.561	2.441	85.359			
14	0.476	2.069	87.428			
15	0.463	2.012	89.440			

TABLE 3 Cronbach's alpha coefficient for the main and subdimensions.

Construct	Cronbach's alpha	Composite reliability	# Statements
Authority/Belonging	0.773	0.778	3
Motivation/Incentives	0.794	0.815	10
Survey Structure	0.705	0.845	6
Ethical Issues	0.790	0.815	4
Reminder/Advance Notice	0.757	0.827	3
Survey Response Propensity Scale total score	0.781	0.820	26



discriminant validity. The third section delineates the outcomes of the structural model, encompassing the evaluation of multicollinearity and the estimate of path coefficients among the specified variables.

4.1 Preliminary results (RQ3)

The sampling was adequately balanced in representing the two major target groups, with 36.6% ($n = 41$) ascertaining as faculty members and 63.4% ($n = 71$) as graduate students. This distribution exists to see that both student and faculty groups are covered, which is crucial in understanding the study's aim of investigating influences on response propensity. With respect to gender, female participants were the majority (66.1%, $n = 74$), whereas male participants constituted 33.9% ($n = 38$). Such a gender distribution may reflect population structure across those schools participating and may influence interpretations made of some variables related to responses. The age split indicated that most (76.8%, $n = 86$) fell in the 20–40-year range, and 23.2% ($n = 26$) were more than 40 years old. This predominantly youthful sample is accounted for by the high proportion of students in the sample and is mostly relevant since age has been found elsewhere to be linked with response style and motivation in survey contexts (e.g., Kolaja et al., 2023). Figure 1 shows the distribution of the sample according to the demographic variables.

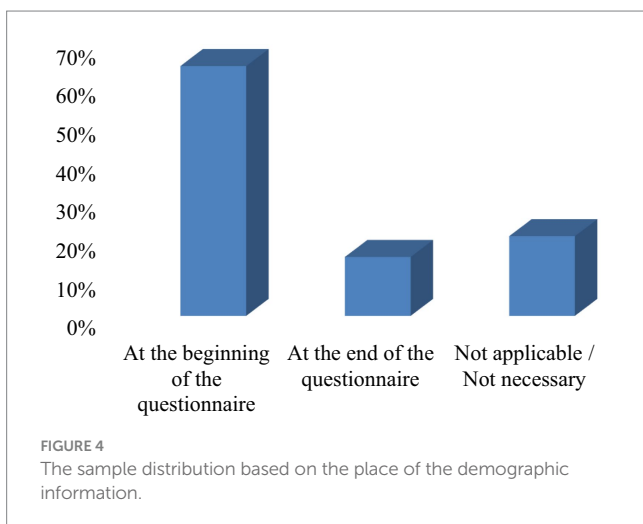
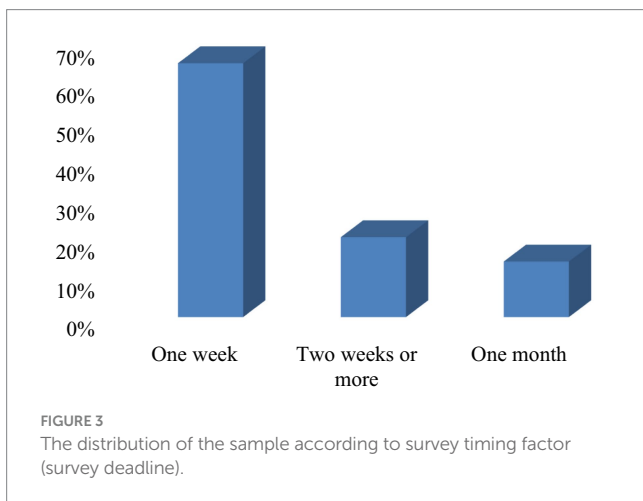
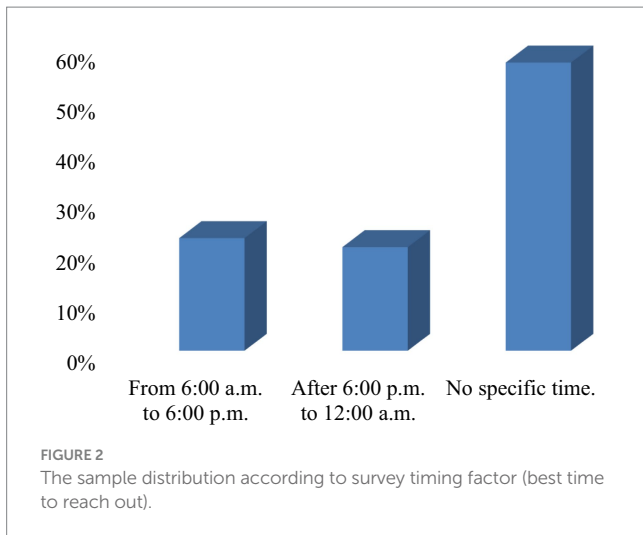
For the factor Survey Timing (best time to complete a questionnaire), more than half (57.1%, $n = 64$) did not have a preferred time, showing flexibility. Approximately 22.3% of them were willing to complete surveys from 6:00 in the morning to 6:00 in the evening, and 20.5% from evening to midnight. These findings could possibly be helpful to optimize delivery times for future online surveys.

Figure 2 shows the distribution of the sample according to best time for questionnaire completion.

Regarding the ideal deadline to return an online questionnaire, the majority (65.2%, $n = 73$) chose 1 week, while 20.5% desired 2 weeks or so, and 14.3% ($n = 16$) 1 month. This suggests that tighter deadlines—but not so tight as to be off-putting—are generally acceptable to the target market and are perhaps liable for more responsiveness rates. Figure 3 shows the distribution of the sample according questionnaire deadline.

As for the best position for demographic questions, most participants (64.3%, $n = 72$) wanted them placed at the start of the instrument. A smaller percentage (15.2%, $n = 17$) wanted them placed at the end, and 20.5% ($n = 23$) felt they were not necessary. This finding identifies the significance of survey layout in optimizing respondent convenience and data completeness. Figure 4 shows the distribution of the sample according to demographic information' location.

Univariate normality was examined using skewness and kurtosis statistics as suggested by Hair et al. (2022). Results in Table 4 indicated that all variables exhibited statistically significant skewness, as the z -skew values exceeded the ± 1.96 threshold ($p < 0.05$), suggesting departures from normal distribution. In addition, most constructs showed significant kurtosis which is an indication of data non-normality. According to the data presented in Table 5, the multivariate skewness of Mardia's test ($b = 7.75, z = 144.75, p < 0.001$) and kurtosis ($b = 55.44, z = 4.01, p < 0.001$) were also found to be statistically significant, confirming a violation of the assumption of multivariate normality. Given these results, PLS-SEM was considered an appropriate analytical approach, as it is robust under conditions of non-normality and smaller sample sizes, and is recommended for prediction-oriented modeling (Hair et al., 2022).



4.2 Measurement model results (RQ1)

With five direct hypothesized relationships and a relatively complex structure, the research aimed to estimate and explain

variance in the focal constructs rather than test model fit in a confirmatory approach. Each structure was evaluated with exploratory factor analysis (EFA), by evaluating the average extracted variance (AVE), the square root of the average extracted variance, and inter-constructive associations for psychometric properties of validity, reliability and dimensionality (Figures 5, 6).

4.2.1 Construct validity

Table 6 provides the information, which includes basic factor loadings for the first-order constructs of each measurement element. Low factor loadings led to the removal of scale items a9, a14, a18, and a26. Every single one of the loads is higher than the minimal required level of 0.5.

4.2.2 Convergent validity

In their analysis of convergent validity, Hair et al. (2022) suggested using indicator loading and the extracted average variance (AVE) to determine the indicator's correlation with overlapping measures in the same model. The AVE and loadings for the latent variables are shown in Table 7. Both the AVE and the loadings must be more than 0.5 in accordance with the guidelines (Hair et al., 2022). All constructs exceeded the benchmark value of 0.50 for convergent model validity, with the exception of Motivation/Incentives, where the AVE was 0.4, which is about 0.5. Despite the AVE of Motivation/Incentives being below the suggested minimum of 0.50, the construct was preserved for theoretical and psychometric considerations. The composite reliability and Cronbach's alpha surpassed acceptable thresholds, signifying sufficient internal consistency. Secondly, Motivation/Incentives constitutes a fundamental facet of DTD, and its omission is logically indefensible, as evidenced by prior empirical research (Lavidas et al., 2022). Nonetheless, the reduced AVE indicates that the items reflect slightly varied dimensions of motivating drives, and associations pertaining to this construct should be approached with caution.

4.2.3 Discriminant validity

In this study, discriminant validity was assessed using two widely accepted techniques: the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT). As demonstrated in Table 8, the square roots of the AVE values for each construct were greater than their corresponding inter-construct correlations, confirming that the constructs share more variance with their own indicators than with others. In addition, the results of the cross-loading assessment showed that each item loaded more strongly on its intended construct than on any alternative construct, with loading differences exceeding the recommended threshold of 0.10 (Hair et al., 2022). Finally, results in Table 8 indicates that all HTMT values were below or sufficiently close to the conservative cutoff of 0.90, further supporting that the constructs are empirically distinct from one another.

4.3 Structural model results

4.3.1 Multicollinearity

Within the framework of the structural model, the degree of colinearity between the predictor constructs was evaluated by utilizing the Variance Inflation Factor (VIF) values. These values offer a common diagnostic for determining the presence of potential multicollinearity issues. For each set of predictor factors that

TABLE 4 Results on the skewness and kurtosis of the study variables, based on a sample of 112.

Constructs	Skewness	SE-skew	Z-skew	Kurtosis	SE-kurt	Z-kurt
Authority/Belonging	-0.991	0.228	-4.337	0.971	0.453	2.142
Ethical Issues	-0.968	0.228	-4.238	1.552	0.453	3.426
Motivation/Incentives	-0.989	0.228	-3.930	1.220	0.453	2.693
Reminders/Advance Notice	-0.863	0.228	-3.780	0.693	0.453	1.530
Survey Structure	-0.810	0.228	-3.547	0.659	0.453	1.454
Survey Response Propensity	-0.950	0.228	-4.157	0.761	0.453	1.695

contributed to the endogenous construct, VIF statistics were created in SPSS after being entered into the program. As shown in Table 9, all the VIF values were discovered to be significantly lower than the commonly accepted thresholds of 5.0 to 10.0 (Field, 2018; Black and Babin, 2019). This indicates that multicollinearity is not a concern in this model and that the predictor constructs provide distinct contributions to the variance that is explained in the outcome variable Survey Response Propensity.

4.3.2 Path coefficients

The value of the path coefficients was obtained using the bootstrapping technique (in 5,000 samples and 310 cases; with no significant changes). Table 10 shows 95% of the coefficients of the direction, *t*-statistics, value point, *p*-values, and related bootstrap confidence. The study of path coefficients and relevance thresholds indicates the value of all direct results. The results showed that all the independent variables have significant impact on dependent variable as shown in Table 10.

Table 10 shows that all hypothesized direct paths between the survey design factors and Survey Response Propensity were statistically significant at *p* < 0.001. Among the predictors, Authority/Belonging demonstrated the strongest positive effect ($\beta = 0.308$), indicating that a one-unit increase in perceptions of institutional authority or sense of belonging leads to an increase of 0.308 units in the self-reported likelihood of responding to web-based surveys. Survey Structure also yielded a meaningful positive effect ($\beta = 0.261$), highlighting the importance of clarity and usability in enhancing participation. Similarly, Ethical Issues ($\beta = 0.246$), Motivation/Incentives ($\beta = 0.245$), and Reminders/Advance Notice ($\beta = 0.245$) each showed significant positive influences, suggesting that better communication of data protection, perceived benefits, and effective follow-up mechanisms contribute significantly to improved self-reported likelihood of responding to web-based surveys. Collectively, these findings confirm that enhancements across each design dimension led to measurable increases in self-reported response propensity.

4.3.3 Variance explained

The *R*² statistic, which is often utilized as an indicator of model fit in linear regression, was utilized in the PLS-SEM structural model in order to evaluate the strength of the hypothesized correlations in terms of their ability to explain the data. To be more specific, *R*² is a measure that indicates the proportion of the variance in the dependent variable that is jointly accounted for by the predictor variables. It also serves as proof of the overall success of the model in capturing the

TABLE 5 Mardia’s multivariate normality tests.

Statistic	<i>b</i>	<i>z</i>	<i>p</i> -value
Skewness	7.754269	144.746362	8.665868e-10
Kurtosis	55.438175	4.010774	5.892531e-05

underlying structural pattern. As shown in Table 11, the *R*² value was 0.966, which suggests that independent variables describe 96.6% of variance in self-reported response propensity. Despite the *R*² value being remarkably high, it necessitates cautious interpretation. The dependent variable indicates respondents’ self-reported likelihood of responding, rather than an observable behavioral response rate, potentially inflating shared variance. Secondly, certain predictors (e.g., Authority/Belonging, Ethical Issues, and Motivation/Incentives) are conceptually aligned with participation intentions, potentially augmenting explanatory overlap in PLS-SEM models. The utilization of a single-source, self-report survey may lead to common method variance, even while Harman’s test reveals no predominant single factor. Consequently, the elevated *R*² indicates robust within-sample explanatory capability; however, it should not be construed as proof of nearly flawless real-world prediction.

When an exogenous construct is systematically removed from the model to calculate its effect size (*f*²), Hair et al. (2022) state that one should look at the change in the coefficient of determination (*R*²). Using this method, researchers can determine the extent to which the missing predictor explains the variation in the endogenous variable. A minor effect is 0.02, a medium effect is 0.15, and a big effect is 0.35; these are the generally used benchmarks for understanding *f*² values (Field, 2018). The effect size of all the independent variables is shown in Table 12. Authority/Belonging have the most significant effect on Survey Response Propensity with effect size of 2.109, followed by Reminders/Advance Notice (*f*² = 1.049), Ethical Issues (*f*² = 0.934), Survey Structure (*f*² = 0.815), and Motivation/Incentives (*f*² = 0.735).

4.3.4 Predictive relevance (*Q*²)

The model was assessed with *R*² for predictive accuracy. Therefore, the *Q*² value of Stone-Geisser can be used for the predictive relevance of the formula. When *Q*² is higher than zero, then the model accurately forecasts the endogenous structures information (Hair et al., 2022). Blindfolding was done in Smart-PLS to get *Q*². During the blindfolding procedure, a systematic omission method was employed, whereby every sixth observation of the endogenous construct indicators was removed and regarded as missing data in SmartPLS. The model subsequently estimated the missing values, and predictive relevance (*Q*²) was calculated by contrasting the anticipated values with the

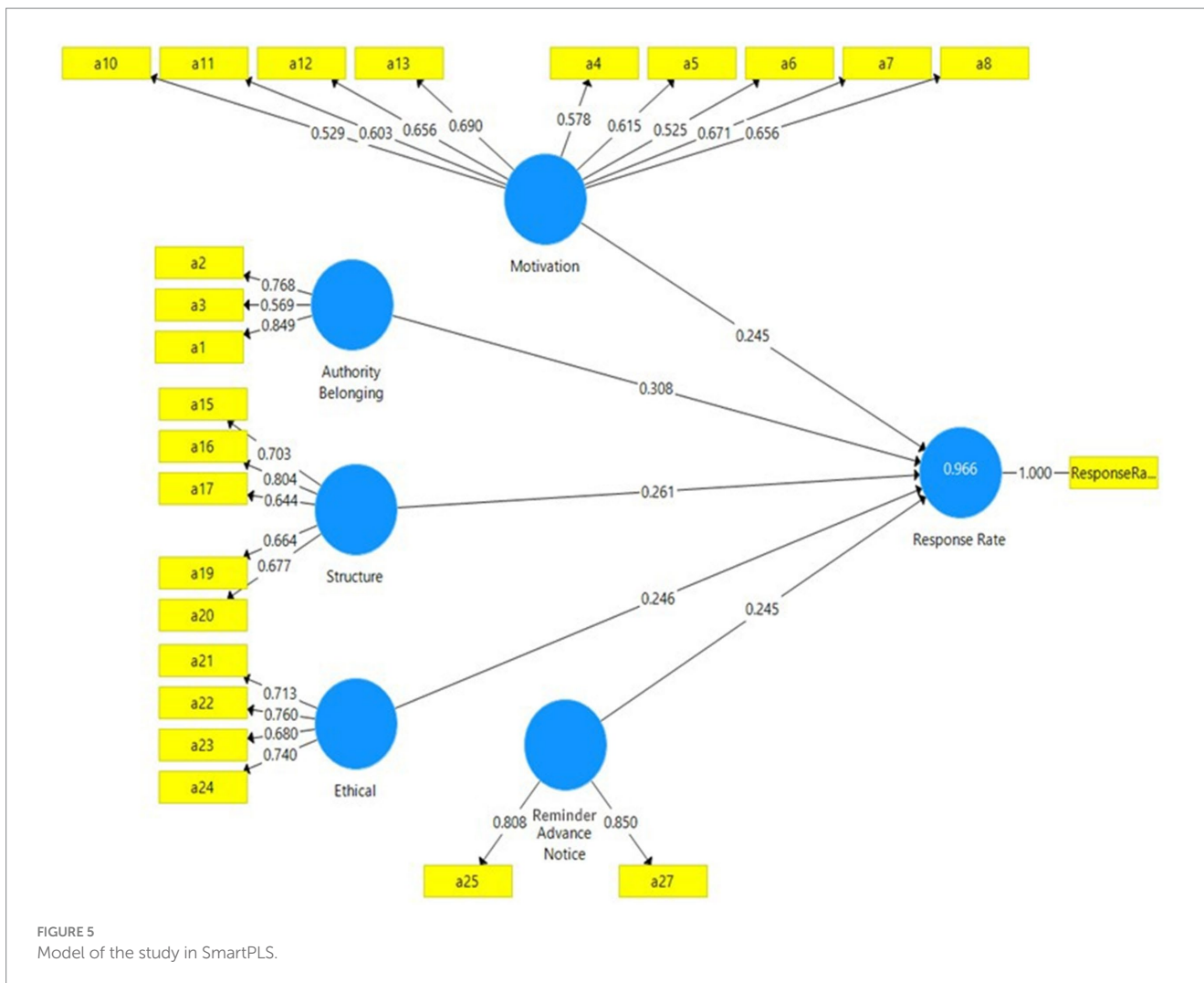


FIGURE 5 Model of the study in SmartPLS.

initially excluded data points (Hair et al., 2022). Table 13 shows the value of the Q^2 of Stone-Geisser. It is notable that there is excellent predictive accuracy for the model where $Q^2 = 0.925 (>0)$.

4.3.5 Importance—performance map analysis

Another aspect of the measuring the structure model is the Important—Performance map (IPM) which is a visual tool for determining the most important independent variable on the dependent variable (Hair et al., 2022). This technique shows two key factors in analyzing the impact of independent variables in dependent variables, the first is the importance which determine the unstandardized total effect of each independent variable on the dependent variable. The other component is performance which represent the average latent variable score (scale from 0 to 100).

According to Table 14, it is notable that Authority/Belonging (0.217) is the most important factor influencing the Survey Response Propensity, followed by Motivation/Incentives (0.194), Survey Structure (0.183), Ethical Issues (0.175). While according to performance, it is notable that Authority/Belonging (0.217) has the most performance factor influencing the Survey Response Propensity, followed by Ethical Issues (72.163), Motivation/Incentives (68.954).

4.4 Associations between response propensity factors and demographics (RQ2)

The Chi-Square test was employed to examine the statistical association between the demographic variables (such as gender, age, and academic position) and each factor of Survey Response Propensity, as follow:

4.4.1 Gender

Table 15 gives the Pearson Chi-Square test results and Goodman-Kruskal gamma coefficients for gender of the participants and each sub-scale of the Web-survey scale. The Chi-Square outcome reveals that gender was significantly correlated with the Authority/Belonging factor ($\chi^2 = 7.762, p = 0.030$) and the Survey Structure factor ($\chi^2 = 15.312, p < 0.001$). For both of them, the gamma coefficients reflect a moderate positive correlation ($\gamma = 0.326$ and $\gamma = 0.539$, respectively), indicating that male and female participants significantly differed in terms of agreement levels on items on these dimensions, that even at the aggregate scale level, gender was also found to be significantly associated with scale total score ($\chi^2 = 12.063, p = 0.013; \gamma = 0.430$), again reflecting a moderate positive correlation. For the remaining sub-scales, i.e., Motivation/Incentives factor

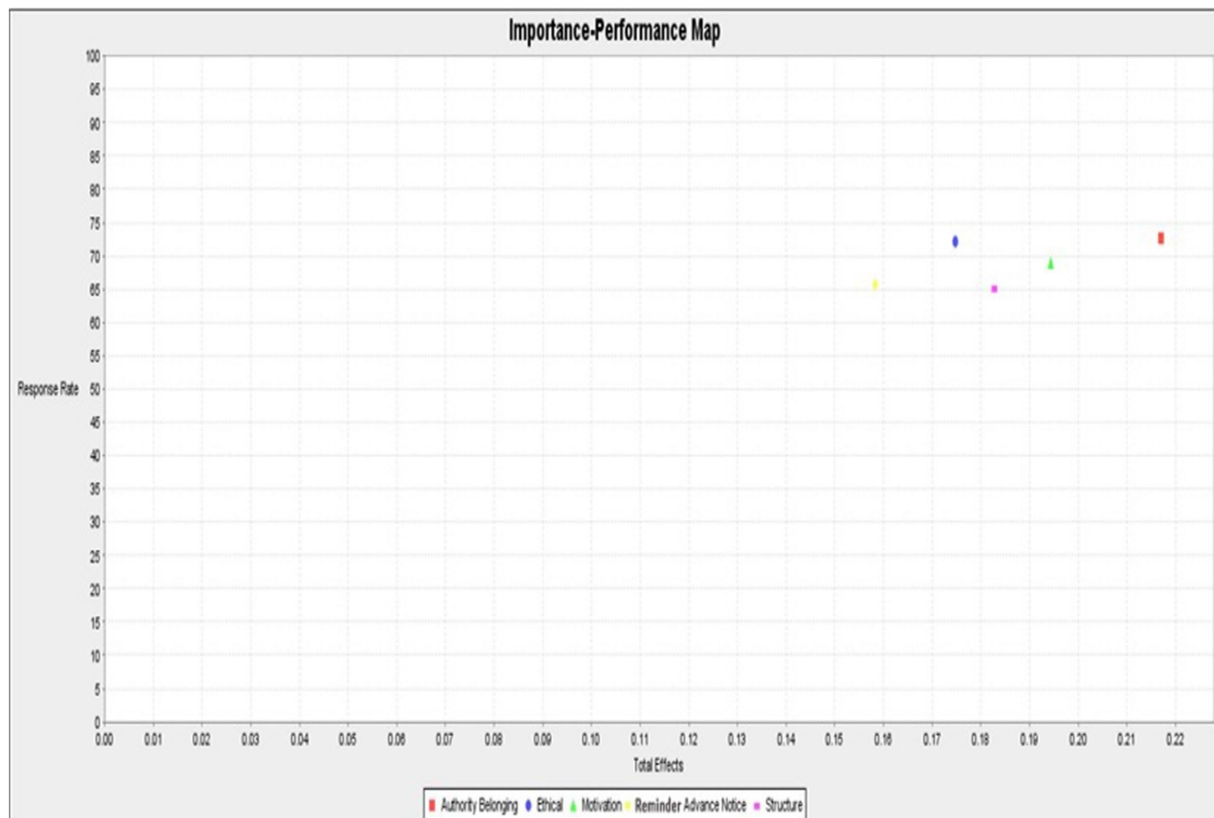


FIGURE 6
Importance–performance map.

($p = 0.054$), Ethical Issues ($p = 0.055$), and Reminder/Advance Notice ($p = 0.138$), the correlations were not statistically significant despite gamma values for Motivation/Incentives factor ($\gamma = 0.303$) and Ethical Issues ($\gamma = 0.315$) showing small-to-moderate positive trends that were nearly significant.

4.4.2 Age

Table 16 shows Pearson Chi-Square results, Goodman–Kruskal gamma coefficients, and significance levels for the association between participants' age group and each sub-scale of Survey Response Propensity measure and all-scale score, and the result is that there were no statistically significant relationships between age group and any of the sub-scales at the 0.05 level. Gamma coefficients ranged from -0.429 to 0.043 , meaning very weak to moderate positive and negative relationships, none of which met conventional statistical significance, these results suggest that, for this sample, age group did not make a statistically significant contribution to how participants perceived the various factors that determined their likelihood of responding to academic web-based questionnaires.

4.4.3 Academic position

Table 17 presents the Pearson Chi-Square tests, Goodman–Kruskal gamma coefficients, and p -levels for the correlations among demographic factor academic position (i.e., participants' categorical descriptor, e.g., role classification) and all Survey Response Propensity sub-scales, as well as the total scale score. No statistically significant

correlations were found between academic position and any of the sub-scales or the total scale score, and all p -values were larger than 0.05. Gamma coefficients ranged from -0.142 to 0.236 and reflect very weak positive or negative relationships.

5 Discussion

This study examined factors influencing perceived survey response behavior among Saudi faculty members and graduate students, focusing on five design-related variables within Dillman's Tailored Design Method (TDM). The results indicated that Authority/Belonging and Motivation/Incentives significantly predicted response propensity, while Ethical Issues and Survey Structure showed moderate but meaningful effects. Authority/Belonging emerged as the most significant predictors, indicating that trust in the survey sponsorship and the sense of social affiliation substantially enhance respondent engagement. Survey Structure was also vital; it showed how important it is for user-centered digital survey methods to be clear, brief, and easy to complete. Positive effects were also seen with ethical assurances, perceived benefits, and follow-up processes. This suggests that well-planned communication and respondent-support mechanisms are still important for reducing non-response. In general, the pattern of results shows that the quality and design of the survey experience have greater impact on how faculty and graduate students engage than their own attributes.

5.1 Authority/Belonging as prominent predictor

The strong effect of Authority/Belonging ($f^2 = 2.109$) supports a core premise of the TDM Theory. However, because the dependent

TABLE 6 Factor loadings of the constructs.

Constructs	Items	Factor loadings
Authority/Belonging	a1	0.849
	a2	0.768
	a3	0.569
Motivation/Incentives	a4	0.578
	a5	0.615
	a6	0.525
	a7	0.671
	a8	0.656
	a10	0.529
	a11	0.603
	a12	0.656
	a13	0.69
	Survey Structure	a15
a16		0.804
a17		0.644
a19		0.664
a20		0.677
Ethical Issues	a21	0.713
	a22	0.76
	a23	0.68
	a24	0.74
Reminders/Advance Notice	a25	0.808
	a27	0.85

Items (a9, a14, a18, a26) were deleted due to insufficient factor loading.

TABLE 7 Average variance extracted.

Constructs	AVE
Authority/Belonging	0.545
Ethical Issues	0.524
Motivation/Incentives	0.400
Reminders/Advance Notice	0.688
Survey Structure	0.500

TABLE 8 HTMT ratio.

Constructs	Ethical Issues	Motivation/Incentives	Authority/Belonging	Reminders/Advance Notice	Survey Structure
Ethical Issues	–	0.776			
Motivation/Incentives	0.576	–	0.880		
Authority/Belonging	0.858	0.929	–	0.953	
Reminders/Advance Notice	0.510	0.772	0.591	–	
Survey Structure	0.430	0.702	0.896	0.903	–

variable is perceptual and closely aligned conceptually with authority cues, this effect should be interpreted as reflecting strong relational influence rather than a precise estimate of actual behavioral impact. As proposed by Dillman et al. (2014), persons are more inclined to participate when they perceive trust, legitimacy, and reciprocal benefit in the research connection. In collectivist cultures like Saudi Arabia, institutional connection and social belonging significantly influence the propensity to engage. The significant predictive value of this factor indicates that confidence in institutional sponsorship and the perception of contributing to a collective academic mission greatly improve survey participation.

These findings corroborate other studies by Lavidas et al. (2022) and Hendra and Hill (2018), which indicated that the legitimacy of the sponsoring institution enhances both perceived value and ethical trust. In the Saudi context—where educational institutions are pivotal to national development under Vision 2030—the perceived authority of the university or ministry may possess enhanced moral and civic significance, prompting teachers and graduates to regard involvement as a professional obligation. This corresponds with the social-exchange theory, which posits that engagement is reciprocated through a sense of belonging and mutual progress (Saleh and Bista, 2017).

5.2 Reminders/Advance notice as participation promoter

Reminders/Advance Notice emerged as the second-most significant predictor ($f^2 = 1.049$), highlighting the necessity of continuous and purposeful communication. This outcome aligns with empirical findings indicating that timely reminders enhance visibility, diminish memory loss, and demonstrate sustained researcher involvement (Petrovčič et al., 2016; Saleh and Bista, 2017). The discovery corroborates Dillman’s suggestion to employ many, strategically timed contact points that prioritize recognition and legitimacy over mere persistence.

In Saudi academia, characterized by email saturation and conflicting institutional expectations, reminders can act as nuanced indicators of sincerity and respect, especially when tailored to the individual. The positive correlation identified indicates that respondents view reminders not as intrusive, but as validations of their significance to the study process. This analysis underscores the need of humanized communication tactics in digital survey contexts (Hossan et al., 2023).

5.3 Ethical issues and research transparency

Ethical Issues significantly influence participation ($f^2 = 0.934$), indicating that assurances of privacy, data security, and explicit

purpose statements remain crucial for encouraging involvement. This finding corroborates previous studies indicating that individuals are more inclined to engage when they trust that their information will be utilized ethically (Klingwort and Toepoel, 2025; Maliković and Tončić, 2021).

In Saudi higher education, ethical assurances are particularly crucial as institutions increasingly focus on digital ethics and privacy regulations. The findings indicate that establishing explicit connections to ethical assessment, data storage security, and anonymity not only diminishes resistance but also enhances the ethical dimension of reciprocity in Social Exchange Theory. Promoting ethical openness is an essential strategy and a societal need for enhancing response propensity.

5.4 Survey Structure and intellectual convenience

The Survey Structure demonstrated a positive and substantial correlation with the response rate ($f^2 = 0.815$). This discovery underscores the need of a clean layout, succinct questions, logical progression, and mobile optimization, especially in online surveys. Prior research (Maliković and Tončić, 2021; Lavidas et al., 2022) indicates that user-centered survey design decreases cognitive load and attrition rates, reinforcing the notion that technical simplicity enhances perceived ease of participation—an essential component of TDM.

TABLE 9 Multicollinearity of items.

Items	VIF	Items	VIF
a10	1.579	a24	1.341
a11	1.475	a25	1.166
a12	1.971	a27	1.166
a13	1.938	a3	1.064
a15	1.563	a4	1.757
a16	1.864	a5	1.718
a17	1.369	a6	1.481
a19	1.313	a7	1.516
a2	1.348	a8	1.636
a20	1.387	a1	1.369
a21	1.525		
a22	1.658		
a23	1.197		

TABLE 10 Path coefficients.

Paths	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics (O/STDEV)	Sig
Authority/Belonging → Survey Response Propensity	0.308	0.309	0.027	11.243	0.0001
Ethical Issues → Survey Response Propensity	0.246	0.241	0.026	9.44	0.0001
Motivation/Incentives → Survey Response Propensity	0.245	0.246	0.027	8.992	0.0001
Reminders/Advance Notice → Survey Response Propensity	0.245	0.242	0.029	8.376	0.0001
Survey Structure → Survey Response Propensity	0.261	0.263	0.031	8.49	0.0001

This study indicates that while structure had a slighter impact than authority or reminders, its importance highlights that effective design quality enhances relational and motivating factors. An organized tool conveys professionalism and respect for respondents' time, hence enhancing confidence and reciprocity. The results indicate that Saudi institutions ought to persist in their investment in professional digital survey design technologies that improve clarity and accessibility across various devices.

5.5 Motivation/Incentives as secondary yet meaningful predictor

Motivation/Incentives ($f^2 = 0.735$) showed the smallest effect size among the five predictors; however, it remained significantly positive. Given its lower convergent validity, this effect should be interpreted as reflecting perceived motivational influence rather than a precise estimate of a single, unified incentive dimension. This pattern corresponds with current research indicating that material or external rewards have less influence in academic or professional contexts compared to internal or social motives (Gummer et al., 2021; Ward and Edwards, 2021). In higher education, instructors and graduate students may exhibit greater responsiveness to ethical motives—such as promoting institutional quality or aiding peer research—than to external incentives.

From a Social Exchange perspective, this suggests that the symbolic worth of aiding in shared academic advancement surpasses physical advantages. Nonetheless, incorporating minor gestures of gratitude or recognition messages is advantageous, especially when paired with individualized dialogue and institutional support.

5.6 Demographic insights: gender, age, and academic position

The findings regarding demographic characteristics offer more understanding of survey participation patterns within the context of Saudi higher education. Differences by gender were observed to slightly correspond with existing studies on demographic factors affecting online survey participation. Although several studies have indicated weak or nonsignificant gender effects (Lavidas et al., 2022; McKibben et al., 2025), others have detected differences in digital communication and engagement behaviors, particularly in contexts influenced by perceptions of trust, belonging, and usability (Saleh and Bista, 2017; Jildeh et al., 2021; Kolaja et al., 2023). The current findings confirm this latter viewpoint, illustrating that gender substantially affected perceptions of authority and the clarity of Survey

Structure—two elements crucial to the sense of confidence and comfort in participation. The findings indicate that male and female respondents may differ in their perceptions of institutional authority cues and user experience in digital surveys, potentially mirroring broader socialization tendencies in academic communication.

The lack of gender differences in Motivation/Incentives, Ethical Issues, and Reminders/Advance Notice suggests that these elements are predominantly seen in a similar manner by all genders (Petrovčić et al., 2016; Maliković and Tončić, 2021; Klingwort and Toepoel,

2025). This trend substantiates the claim that fundamental participation mechanisms—trust, perceived mutuality, and diminished effort—are universal behavioral reactions rather than constrained by gender. According to Social Exchange Theory, this convergence indicates that both male and female participants react similarly to signals of fairness, trust, and transparency, which are fundamental motivators for voluntary involvement (Dillman et al., 2014). The findings indicate that survey design elements related to authority and structure may require gender-sensitive adjustments, although other engagement aspects seem generally relevant across subgroups (Price et al., 2022; Holtom et al., 2022).

The results indicate that age has a minimal or negligible effect on online survey participation in higher education, aligning with current research. Lavidas et al. (2022) showed no significant correlation between age and participation intention among instructors, but McKibben et al. (2025) observed analogous findings among agricultural educators. Holtom et al. (2022) similarly determined that methodological and structural factors, rather than demographic characteristics, are the principal predictors of response behavior. The present study corroborates this conclusion: when individuals possess similar academic and digital literacy contexts, as shown in Saudi graduate education, age diminishes in significance as a predictor of involvement. This indicates that the digital change in higher education may be leveling participation possibilities among different age groups.

Likewise, the academic status (faculty compared to graduate students) exhibited no notable changes in response behavior. Both groups shown comparable responsiveness to the five design criteria, suggesting that professional rank does not significantly influence perceptions of authority, ethics, or motivation in survey participation. This discovery aligns with previous research indicating negligible impacts of respondent demographic traits on response rates (Lavidas et al., 2022; McKibben et al., 2025). Recent analyses (Holtom et al., 2022; Ziegenfuss et al., 2021) have similarly underscored that the legitimacy, structure, and communication tactics of surveys are more significant than demographic factors in influencing participation. Consequently, in alignment with previous studies in educational and professional fields, the current findings indicate that efficient survey design concepts can be universally implemented across academic roles with minimal alteration.

These demographic observations collectively support the foundational premise of Social Exchange Theory: involvement in online surveys is predominantly influenced by relational and structural factors—trust, mutuality, perceived advantage, and minimized effort—rather than fixed demographic characteristics. By fostering fair design, honest communication, and institutional legitimacy, researchers can improve inclusivity and engagement

TABLE 11 Variance explained (R^2).

Dependent variable	R^2	R^2 adjusted
Survey Response Propensity	0.966	0.964

TABLE 12 Effect size of all variables.

Independent variables	Effect size
Authority/Belonging	2.109
Ethical Issues	0.934
Motivation/Incentives	0.735
Reminders/Advance Notice	1.049
Survey Structure	0.815

TABLE 13 Predictive relevance (Q^2).

Constructs	SSO	SSE	$Q^2 (=1 - SSE/SSO)$
Authority/Belonging	336	336	
Ethical Issues	448	448	
Motivation/Incentives	1,008	1,008	
Survey Response Propensity	112	8.38	0.925
Reminders/Advance Notice	224	224	
Survey Structure	560	560	

TABLE 14 Important—performance.

Constructs	Importance	Performance
Authority/Belonging	0.217	72.557
Ethical Issues	0.175	72.163
Motivation/Incentives	0.194	68.954
Reminders/Advance Notice	0.158	65.747
Survey Structure	0.183	65.087

TABLE 15 Associations between sub-scales and participants' gender.

Demographic factor	Subscale	Pearson Chi-square	Gamma	Sig.
Gender	Authority/Belonging	7.762 ^a	0.326	0.030
	Motivation/Incentives	8.798 ^a	0.303	0.054
	Survey Structure	15.312 ^a	0.539	0.000
	Ethical Issues	13.220 ^a	0.315	0.055
	Reminder/Advance Notice	8.741 ^a	0.238	0.138
	Survey Response Propensity	12.063 ^a	0.430	0.013

a = statistically significant at $p < .05$.

TABLE 16 Associations between sub-scales and participants' age.

Demographic factor	Subscale	Pearson Chi-square	Gamma	Sig.
Age	Authority/Belonging	0.645 ^a	0.043	0.805
	Motivation/Incentives	10.059 ^a	-0.064	0.738
	Survey Structure	10.405 ^a	-0.329	0.068
	Ethical Issues	8.003 ^a	-0.429	0.198
	Reminder/Advance Notice	1.269 ^a	-0.046	0.802
	Survey Response Propensity	7.824 ^a	-0.379	0.055

a = statistically significant at $p < .05$.

TABLE 17 Associations between sub-scales and participants' academic position.

Demographic factor	Subscale	Pearson Chi-square	Gamma	Sig.
Academic position	Authority/Belonging	3.990 ^a	0.061	0.688
	Motivation/Incentives	9.580 ^a	0.236	0.130
	Survey Structure	8.339 ^a	0.102	0.524
	Ethical Issues	1.690 ^a	0.096	0.553
	Reminder/Advance Notice	1.967 ^a	-0.142	0.367
	Survey Response Propensity	3.031 ^a	0.198	0.264

a = statistically significant at $p < .05$.

among diverse gender, age, and academic subgroups in higher education.

5.7 Descriptive insights on survey timing

Although Survey Timing was not included in the inferential model, it was utilized to ascertain participants' preferred times for completing online surveys and their desired timing for receiving responses. Lavidas et al. (2022) posited that timing is a contextual variable that interacts with institutional schedules and individual obligations. Over 50 % of respondents (57.1%, or 64 individuals) did not specify a preferred time for the poll. This indicates that the majority of individuals are adaptable and willing to participate in surveys at any hour of the day. Among those expressing a willingness to complete surveys, 22.3% preferred to do so between 6 a.m. and 6 p.m., while 20.5% favored the overnight hours until midnight. This indicates that online surveys can be disseminated at various times throughout the day and remain effective, thereby accommodating individuals with diverse schedules. Similar to the findings of Lavidas et al. (2022), which indicated that teachers' technological proficiency facilitates student participation beyond conventional hours, this trend demonstrates an increasing flexibility in online academic engagement. Moreover, a majority of respondents (65.2%, $n = 73$) said that the optimal timeframe for returning a questionnaire is within 1 week. Twenty-five percent said it should occur within 2 weeks, while 16 % ($n = 16$) believed it should occur within 1 month. Prior research (Saleh and Bista, 2017; Petrovčić et al., 2016) indicated that shorter yet realistic deadlines elicit more replies, since they maintain a sense of importance and urgency without overwhelming individuals. The Social Exchange Theory posits that these preferences represent a balance between perceived effort and reciprocal commitment. Individuals are more inclined to engage when time commitments are manageable, and the researcher demonstrates

equity and regard by honoring their availability. This conduct aligns with Dillman et al. (2014) Tailored Design Method: when participants see their time is valued, they are more inclined to engage punctually.

Overall, these findings indicate that faculty members and graduate students exhibit considerable flexibility regarding the completion of surveys. Strategically designed delivery and realistic response timeframes increase the likelihood of survey completion. Incorporating daily and longitudinal time sensitivity enhances the relational dimension of the survey process by demonstrating trust, reciprocity, and respect. This underscores the principles of social interaction that enable individuals to willingly participate in academic research. This trend illustrates the impact of contextual and workload-related factors on participation behavior.

5.8 Implications

This study shows that elements such as trust, credibility, and a survey's usability play a key role in encouraging participants engagement—even when demographic characteristics have slight influence. The strong effects of Authority/Belonging and Survey Structure on response behavior support the core ideas of Social Exchange Theory and demonstrate that Dillman's TDM is applicable to Saudi graduate students and faculty members.

Overall, the findings add to the expanding research on digital survey design by confirming that well-designed communication strategies and user-friendly formats are especially important in higher-education settings. For educators and researchers, the results emphasize the importance of clear messaging, credible sponsorship, and ethical transparency when distributing online questionnaires. Universities can improve participation by using thoughtful outreach methods, personalized invitations, strong confidentiality assurances, and straightforward survey layouts. Additionally, fostering a culture that values research and participation can help boost response

propensity and enhance the quality of data collected in future academic studies.

6 Conclusion

This study offers an in-depth analysis of the factors affecting online survey participation among faculty and graduate students in Saudi higher education. The findings indicate that participation is predominantly influenced by relational and structural factors—namely Authority/Belonging, Reminders/Advance Notice, Ethical Issues, Survey Structure, and Motivation/Incentives—whereas Survey Timing and demographic attributes provide contextual but subordinate insights. The findings indicate that perceptions of trust, institutional legitimacy, and usability are more significant than demographic factors like gender, age, or academic position in elucidating engagement behavior.

Based on Social exchange Theory, the findings confirm that participants engage when they view the interaction as equitable, reliable, and advantageous for both sides. The substantial impacts of Authority/Belonging and Survey Structure offer robust empirical evidence for Dillman's Tailored Design Method, affirming its relevance in collectivist and digitally evolving educational institutions. These findings underscore that effectively crafted, transparent, and sensitive communication techniques can convert theoretical concepts of equality and perceived worth into quantifiable gains in response propensity.

The study emphasizes the significance of clear communication, reliable institutional endorsement, and intuitive design in enhancing involvement. Universities can improve involvement by utilizing individualized reminders, transparent ethical assurances, and culturally sensitive outreach strategies. Subsequent investigations should analyze longitudinal and cross-cultural extensions of these findings to assess how changing digital behaviors and trust dynamics influence participation in academic research. These findings suggest that well-structured, transparent, and institutionally credible communication associated with increased self-reported response propensity in this sample. The findings validate the significance of Dillman's TDM in elucidating how trust, usability, and reciprocity influence perceived desire to engage in academic surveys.

7 Limitation and future research

This work provides valuable evidence, although certain limitations must be recognized. The sample was obtained from a single college inside one Saudi university, perhaps limiting the generalizability of the findings to other fields or institutional settings. Accordingly, the findings should be interpreted as context-specific and not automatically generalized to other institutions or national populations. The voluntary aspect of participation and the employment of non-probability sampling may restrict representativeness, as those who opted out may systematically differ from those who engaged. Moreover, dependence on self-report data presents the risk of social desirability bias and common-method variance. Moreover, reliance on Harman's single-factor test offers a restricted assessment of CMB; subsequent research should employ more rigorous methodologies, such as marker variables or multidimensional designs.

Although PLS-SEM was suitably chosen for smaller and non-normally distributed samples, subsequent research might gain by utilizing larger, more diversified, and probabilistic samples to validate the associations identified herein. The cross-sectional design further limits causal interpretation; longitudinal or experimental methods could elucidate how enhancements in survey design affect participation over time. In addition to perceptual data, using behavioral metrics such as response tracking, completion timing, or qualitative interviews will enhance comprehension of the motivating mechanisms driving participation.

Furthermore, the study did not investigate potential moderating variables—such as digital literacy, past research experience, or workload—that could influence sensitivity to survey design elements. Investigating these characteristics may improve comprehension of the environmental and psychological factors influencing survey conduct. The swift advancement of digital communication technologies necessitates investigation into how emerging platforms—such as mobile applications, institutional dashboards, and social media—influence participation patterns and perceptions of trust.

Ultimately, expanding this investigation across several domains within higher education, including STEM subjects, may uncover wider disciplinary differences in participation. Since the majority of participants in this study were from the Arts and Humanities, investigating populations in Science, Health, and Medicine could yield a more nuanced and comprehensive understanding of the factors influencing participation across academic disciplines.

Addressing these limitations through multiple methodological and cross-cultural methods will strengthen theoretical generalization, improve predictive accuracy, and inform better survey design practices in higher education.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving humans were approved by the studies involving human participants were reviewed and approved by the Research Ethics Committee, Deanship of Scientific Research, King Faisal University, Saudi Arabia (Approval No. KFU-REC-2024-MAY-ETHICS2271). The participants provided their informed consent electronically by proceeding with the online survey. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

FA-A: Methodology, Data curation, Formal analysis, Project administration, Visualization, Conceptualization, Validation, Writing – original draft, Software, Writing – review & editing, Supervision, Investigation, Funding acquisition, Resources.

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Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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