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Perception of Safety Management and Safety Culture Among Ab-Initio Pilots

Öğrenci Pilotlar Arasında Emniyet Yönetimi ve Emniyet Kültürünün Algısı



İbrahim Tunç¹ & Bilal Kılıç²

¹ Nisantasi University, Faculty and/or Air Traffic Control, İstanbul, Türkiye

² Assoc. Prof. Dr., Independent Scholar, İstanbul, Türkiye

Abstract

Safety management systems and safety culture are of paramount importance in identifying and managing threats. Although some research has been carried out on safety culture among airline and military pilots, far too little attention has been paid to this issue among ab-initio pilots. With these considerations in mind, the aim of this study was to examine the perceptions of safety management and safety culture among the ab-initio pilots. Based on the survey data gathered from the student pilots in Turkey, a one-way ANOVA test was performed. The questionnaire included 26 items that sought participants' perceptions of attitudes and beliefs regarding safety management systems and safety culture in their flight training organisations. Four dimensions were evaluated. Response rate: 47.3% It was found that ab-initio pilots perceive 'luck and safety' and 'organisational dynamics & positive safety practises' as the most important factors. Results showed that there was a significant correlation between each dimension and the course related to safety management and the safety culture of an organisation (e.g., flight school and aviation faculties). The findings of this study may help flight training organisations to improve the management of the safety climate among student pilots and improve aviation safety overall.

Öz

Emniyet yönetim sistemi ve emniyet kültürü, tehditleri tanımlamak ve yönetmek açısından son derece önemlidir. Havayolu pilotları ve askeri pilotlar arasında emniyet kültürü üzerine bazı araştırmalar yapılmış olmasına rağmen, bu konu öğrenci pilotlar arasında çok az dikkat çekmiştir. Bu durum göz önünde bulundurularak, bu çalışmanın amacı öğrenci pilotlar arasındaki emniyet yönetimi ve emniyet kültürü algılarını incelemektir. Türkiye'deki öğrenci pilotlardan toplanan anket verilerine dayanarak tek yönlü ANOVA testi yapılmıştır. Anket, katılımcıların uçuş eğitim organizasyonlarındaki emniyet yönetim sistemi ve emniyet kültürü ile ilgili tutum ve inançlarına ilişkin algılarını ölçmeye yönelik 26 madde içermektedir. Dört boyut değerlendirilmiştir. Yanıt oranı %47,3 olmuştur. Öğrenci pilotların 'şans ve emniyet' ile 'örgütsel dinamikler ve pozitif emniyet uygulamaları' nı en önemli faktörler olarak algıladıkları bulunmuştur. Sonuçlar, her bir boyut ile bir organizasyonun (örneğin uçuş okulu ve havacılık fakülteleri) emniyet yönetimi ve emniyet kültürüyle ilgili kurs arasında anlamlı bir korelasyon olduğunu göstermiştir. Bu çalışmanın bulguları, uçuş eğitim organizasyonlarının öğrenci pilotlar arasındaki emniyet iklimini yönetmelerini iyileştirmelerine yardımcı olabilir ve genel olarak havacılık emniyetini artırabilir.

Keywords

Safety Management System · Safety culture · Organization · Ab-initio pilots · Aviation

Anahtar Kelimeler

Emniyet Yönetim Sistemi · Emniyet Kültürü · Organizasyon · Öğrenci Pilot · Havacılık



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✉ Corresponding author | Sorumlu Yazar: Bilal Kılıç capt.bilalkilic@gmail.com



Perception of Safety Management and Safety Culture Among Ab-Initio Pilots

Safety management system (SMS) is an essential component of ensuring safety. It is primarily used for identifying and managing threats before unwanted situations (e.g., accidents and incidents) occur (ICAO, 2013). It is an organised approach to identifying hazards and threats and managing safety, including the necessary policies and procedures. An SMS system is a dynamic risk management system applied in a safety culture system (Stolzer et al., 2008).

Safety culture is a term defined by the International Atomic Energy Agency (IAEA) in 1991. Safety culture refers to “the assembly of characteristics, attitudes and behaviours in organisations, individuals, and institutions, which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance (IAEA, 1999).

It has been practised in critical industries such as aviation, nuclear energy, and health care to prevent errors and enhance safety (Li & Guldenmund, 2018). The SMS system has also been used in education institutions to decrease the number of accidents and incidents at schools, colleges, and universities (Hasan & Younos, 2020).

Safety management systems and safety culture are major areas of interest within the field of aviation and play an important role in ensuring safety by managing safety risks and assuring the effectiveness of safety risk controls (Stolzer et al., 2008) (Adjekum & Tous, 2020). Findings from investigations into aircraft accidents and incidents have led to a renewed interest (e.g., awareness of interaction between human factors and other aspect of aviation safety, students’ perception of risk factors, and more standardisation of curricula) in safety management systems and safety culture (Hong et al., 2016). Previous studies have reported that organisational factors (e.g., lack of training provided by companies and inadequate supervision and procedures) contribute to aviation accidents and incidents (Kilic & Gundogdu, 2020)(Havle & Kilic, 2019).

It is a well-known fact that accidents, incidents, and near-misses can occur due to poor safety culture and a lack of safety practises (Stolzer et al., 2008). Flight training organisations can systematically manage risks such as work-related stressors (Kilic & Tabak, 2022a; Kilic & Ucler, 2019), fatigue (Kilic, 2021a), lack of situational awareness (Kilic, 2019; Kilic & Buyuksoy, 2022), mental health(Kilic, 2022; Kilic & Tabak, 2022b), and knowledge (Havle & Kılıç, 2019; Bilal Kilic, 2021b; Bilal Kilic & Soran, 2020) associated with flight operations (e.g., training, check, and cross-country flights)(Kilic & Gumus, 2020). Examining ab-initio pilots’ perceptions of safety culture is essential for understanding how a flight training organisation (FTO) can influence students’ behaviour during a flight (Adjekum, 2014).

Ab-initio pilots should gain safety culture in the early stages of flight training. FTOs and aviation faculties can introduce various courses (e.g., aircraft accident investigation, safety management system, crew resource management, human factors) to increase safety perception among student pilots during the ab-initio pilot training (Kilic & Soran, 2019)

The research to date has tended to focus on airline pilots’ safety perception rather than ab-initio pilots’ perception (Liao, 2015). To the best of the authors’ knowledge, there has been little discussion about the perception of safety management and safety culture among ab-initio pilots. With these considerations in mind, we defined the following research questions;

Q1: Is there any correlation between a safety-related undergraduate course in a collegiate aviation program and the ab-initio pilots’ safety perception?

Q2: Does the perception of safety culture and safety management system among ab-initio pilots vary according to their demographics?

Materials and Methods

Study design

The questionnaire was derived from the previously published article (Gill & Shergill, 2004) and was sent online to 800 student pilots who were participating in the ab-initio flight training programme around Turkey. The survey comprised two parts: (i) demographic items and (ii) safety management systems and safety culture in organisations (26 items). Response rate: 47.3% There were 70 (18.5%) female and 309 (81.5%) male student pilots. Of the participants, 35.9% (N=136) had student pilot licences (SPL), 31.1% (N=118) had private pilot licences (PPL), and 33.0% (N=125) had commercial pilot licences (CPL). One-third of the participants (33.5%, N=127) were between the ages of 17 and 23. Of the participants, 37.5% (N=142) were older than 31 years. Ethical approval for the study was obtained from the Özyeğin University’s Human Research Ethics Board (2024/14-BİLAL KILIÇ).

Table 1

Results of the Reliability and Validity Tests

Variables	Dimensions			
	D 1	D 2	D 3	D 4
v1 There is an open communication between management and student pilots about safety issues.	0,781			
v2 Management usually informs student pilots of incidents and their outcomes.	0,795			
v3 Safety information is brought to student pilots’ attention by their managers/supervisors.	0,818			
v4 Management takes a personal interest in safety compliance.	0,757			
v5 Even due to financial pressures, safety takes priority.	0,747			
v6 If student pilots safety is at risk, managers halt operations.		0,770		
v7 Even if it means lost revenue, the management does not expect student pilots to ignore safety.		0,712		
v8 Management encourages fearless reporting of incidents, errors, and safety concerns.		0,841		
v9 Managers have open discussion with student pilots about safety issues.	0,825			
v10 Student pilots don’t risk their jobs/trainings when they report safety concerns to management.		0,831		
v11 The knowledge gained from incident reviews is usually put into practice.		0,734		
v12 Management allocates resources to meet safety needs.		0,761		
v13 Management knows what goes on in operations.		0,690		
v14 Management does something about hazards before accidents can occur.		0,786		
v15 Most student receive adequate initial training to confidently do the job.	0,761			
v16 Student pilots don’t face reprisal for raising safety issues.				
v17 The regulator’s (DGCA) rules and policies are clear and simple to follow		0,756		
v18 DGCA’s audits are useful in ensuring safety.		0,746		
v19 You are clear about the difference in DGCA’s safety and enforcement roles.				0,813
v20 You believe accidents will happen no matter what anyone does.			0,580	
v21 Student pilots believe that luck plays a major role in aviation safety.			0,656	
v22 You believe everyone is likely to have an accident sooner or later			0,618	



Variables	Dimensions			
	D 1	D 2	D 3	D 4
v23 Management takes disciplinary action against student pilots for regulatory noncompliance.			0,656	
v24 You have up-to-date software/technology to manage safety systems.			0,675	
v25 Student pilots receive recurrent training			0,694	
v26 Judgement of 'safety at a reasonable cost' does not put people at risk.				0,654
Variation explained %	40,12	15,70	8,16	4,47
Total variation explained %	68,44			
Co. Alpha	0,94			
KMO	0,92			
Barlet,'s	6321,28	p=0,01		

D 1: Organizational Dynamics and positive safety practices

D 2: Regulators' role

D 3: Luck and safety

D 4: Safety management, training, and decision making

Statistical analysis

Data for this study were collected using an online survey. In order to test the reliability of the 26 expressions in this study, Cronbach's alpha analysis was carried out (Darren George & Paul Mallery, 2019). The analysis was performed using the SPSS 25.0 package. The descriptive statistics are presented as frequency, percentage, mean, and standard deviation. Statistical significance was analysed using t-tests and analysis of variance (ANOVA) test as appropriate. The Sidak test was used for paired comparisons (post. Hoc.). Repeated variance analysis was used to examine differences within subdimensions. P values less than 0.05 were considered statistically significant in the study ($\alpha = 0.05$) (Darren George & Paul Mallery, 2019).

Results and Discussion

It was determined that 81.5% of the participants are men and 18.5% are women. It was observed that 33.5% of the participants were 17-23 years old, 29% were 24-30 years old, and 37.5% were 31. Among the participants, 31.1% had PPL licences, 33% had CPL licences, and 35.9% had SPL licences. 96.6% of the participants stated that their companies have a culture of flight safety.

Table 1 illustrates that there are four dimensions; 1) Organizational dynamics and positive safety practices, 2) regulators' roles, 3) Luck and safety, and 4) Safety management training and decision making. The Cronbach's Alpha was 0.94. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.92 (Darren George & Paul Mallery, 2019). These coefficients demonstrate that the scale is reliable and that there is no need to remove any expressions from the survey. Based on the results obtained from Bartlett's test ($\chi^2=6321,28$, $p=0,01$, $p0,< 05$), the dimensions were structurally significant.

The findings of this study revealed that most of the ab-initio pilots (N=366, %96.6) had a safety-related course during flight training. This part of the findings sought to deal with the first research question "Is there any correlation between a safety-related undergraduate course in a collegiate aviation programme and the ab-initio pilots' safety perception?" **Table 2** presents the results obtained from the statistical analyses. From the data in **Table 2**, it is apparent that there was a significant correlation between each dimension (OD-PSP, RR, LS, and SMS-DM) and the course related to safety management and the safety culture of an organisation (e.g., flight school and aviation faculties) ($p=0,01$, $p < 0,05$). From these data, we can see that a

positive correlation was found between the type of pilot licence and each dimension. This result is in good agreement with previous findings (Adjekum, 2014).

Table 2

Effect of a course related to safety management system and safety culture on the perceptions of ab-initio pilots

Factors	Does the curriculum of your organization include a course related to safety management and safety culture?	n	Mean	Std. Deviation	p
Organizational dynamics & positive safety practices (OD-PSP)	Yes	366	4,14	0,75	0,01*
	No	13	3,09	0,69	
Regulator’s role (RR)	Yes	366	3,35	0,61	0,01*
	No	13	2,74	0,64	
Luck and safety (LS)	Yes	366	4,18	0,81	0,01*
	No	13	2,79	0,98	
Safety management, training and decision-making (SMS-DM)	Yes	366	3,68	0,73	0,01*
	No	13	3,15	0,63	

*significant on the level of 0,05

This section of the findings focuses on the second research question: “Does the perception of safety culture and safety management system among ab-initio pilots vary with demographics?” Consistent with the previous findings, [Table 3](#) illustrates that there was a significant correlation between each dimension and the type of pilot licence (e.g., PPL, and CPL) ($p=0,01$, $p < 0,05$) (Adjekum, 2014). In contrast to earlier findings, it was found that there was no significant correlation between each dimension and ab-initio pilots’ ages (Adjekum, 2014).

Table 3

Effect of the current type of pilot license on the participants’ view on the SMS and safety culture

Factors	License	n	Mean	Std. Deviation	p
Organizational dynamics & positive safety practices (OD-PSP)	PPL	118	4,02	0,81	0,01*
	CPL	125	4,34	0,74	
	SPL	136	3,97	0,73	
Regulator’s role (RR)	PPL	118	3,37	0,7	0,01*
	CPL	125	3,40	0,59	
	SPL	136	3,22	0,58	
Luck and safety (LS)	PPL	118	4,00	0,9	0,01*
	CPL	125	4,42	0,8	
	SPL	136	4,00	0,79	
Safety management, training and decision-making (SMS-DM)	PPL	118	3,62	0,76	0,01*
	CPL	125	3,88	0,6	
	SPL	136	3,51	0,77	

*significant on the level of 0,05



As shown in Table 4, ab-initio pilot perceive 'luck and safety' and 'organizational dynamics & positive safety practises as the most important factors. This is in line with previous findings (Gill & Shergill, 2004). 'Safety management, training and decision-making (SMS-DM) was ranked as the second most important factor by the ab-initio pilots.

Table 4

Means and standard deviations of factors related to safety culture and the SMS in flight training organizations

Factors	Mean	Std. Deviation	p	post hoc.
Organizational dynamics & positive safety practices (OD-PSP) (1)	4,11	0,78		
Regulator's role (RR) (2)	3,33	0,62	0,01*	1,3>4>2
Luck and safety (LS) (3)	4,14	0,85		
Safety management, training and decision-making (SMS-DM) (4)	3,67	0,73		

*significant on the level of 0,05

Prior studies have noted the importance of safety management systems and safety culture in commercial aviation (Liao, 2015) and military aviation (Soeters & Boer, 2000). This study is set out with the aim of examining the safety perceptions of ab-initio pilots and the effect of organisations' safety management systems and safety culture.

The current study found that the safety management systems and safety culture in flight training organisations can influence the OD-PSP, RR, LS, and SMS-DM levels and may help improve safety perceptions among ab-initio pilots.

The current study found a strong relationship between the safety perceptions of ab-initio pilots and the introduction of a safety-related course in the curriculum of flight training organisations. It is somewhat surprising that ab-initio pilots have the idea that 'luck plays a major role in aviation safety' and 'accidents will happen no matter what anyone does.' These results match those of earlier studies (Williamson et al., 1997)(Cox & Cox, 1991).

One unanticipated finding was that luck and safety were considered more important for safety management, training, and decision-making. There is abundant room for further progress in determining factors affecting safety culture and safety management systems in flight training organisations. In future investigations, the safety perceptions of ab-initio pilots in military aviation must be examined.

Conclusion

The main goal of the current study was to determine the perceptions of safety management and safety culture among the ab-initio pilots. One of the more significant findings to emerge from this study is that the introduction of safety-related courses in the curriculum of flight training organisations is positively associated with the safety perceptions of ab-initio pilots.

The findings of this study make several contributions to the existing literature. First, it was shown that organisations (e.g., airlines, flight schools, and aviation faculties) were among the most significant factors that can influence pilots' perceptions of safety culture. Second, ab-initio pilots perceive luck and safety as significant contributing factors to safety.

Safety practitioners and aviation experts can strengthen traditional risk control practises in flight training organisations based on the findings of the current study.







The most important limitation lies in the fact that this cross-sectional study was performed in flight training organisations. Ab-initio pilots might have hesitated to disclose their ideas about their flight schools' safety attitudes and practises.

Finally, we could demonstrate that flight training organisations could integrate a safety related course in their curriculum and improve the safety culture among.



Ethics Committee Approval	Ethical approval for the study was obtained from the Özyeğin University's Human Research Ethics Board (2024/14-BİLAL KILIÇ).
Informed Consent	Informed consent was obtained from the participants.
Peer Review	Externally peer-reviewed.
Author Contributions	Conception/Design of study: İ.T., B.K.; Data Acquisition: İ.T., B.K.; Data Analysis/ Interpretation: K.Ö., Z.K.; Drafting Manuscript: İ.T., B.K.; Critical Revision of Manuscript: İ.T., B.K.; Final Approval and Accountability: İ.T., B.K.
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Author Details	İbrahim Tunç
Yazar Bilgileri	¹ Nisantasi University, Faculty and/or Air Traffic Control, İstanbul, Türkiye  0000-0001-6944-2980  ibrahimshgm@gmail.com
	Bilal Kılıç
	² Assoc. Prof. Dr., Independent Scholar, İstanbul, Türkiye  0000-0002-3773-6682  capt.bilalkilic@gmail.com

References | Kaynakça

- Adjekum, D. K. (2014). Safety Culture Perceptions in a Collegiate Aviation Program: A Systematic Assessment. *Journal of Aviation Technology and Engineering*, 3(2), 44-56. <http://doi.org/10.7771/2159-6670.1086>
- Adjekum, D. K., & Tous, M. F. (2020). Assessing the relationship between organizational management factors and a resilient safety culture in a collegiate aviation program with Safety Management Systems (SMS). *Safety Science*, 131. <https://doi.org/10.1016/j.ssci.2020.104909>
- Cox, S., & Cox, T. (1991). The structure of employee attitudes to safety: A european example. *Work and Stress*, 5(2), 93-106. <https://doi.org/10.1080/02678379108257007>
- Darren George, & Paul Mallery. (2019). *IBM SPSS Statistics IBM SPSS Statistics 26 Step by Step 26 Step by Step* (6th ed.). Routledge.
- Gill, G. K., & Shergill, G. S. (2004). Perceptions of safety management and safety culture in the aviation industry in New Zealand. *Journal of Air Transport Management*, 10(4), 231-237. <https://doi.org/10.1016/j.jairtraman.2004.02.002>



- Hasan, M. K., & Younos, T. B. (2020). Safety culture among Bangladeshi university students: A cross-sectional survey. *Safety Science*, 131. <https://doi.org/10.1016/j.ssci.2020.104922>
- Havle, C. A., & Kilic, B. (2019). A hybrid approach based on the fuzzy AHP and HFACS framework for identifying and analyzing gross navigation errors during transatlantic flights. *Journal of Air Transport Management*, 76, 21-30. <https://doi.org/10.1016/j.jairtraman.2019.02.005>
- Hong, S. J., Lee, K. S., Seol, E. S., & Young, S. (2016). Safety perceptions of training pilots based on training institution and experience. *Journal of Air Transport Management*, 55, 213-221. <https://doi.org/10.1016/j.jairtraman.2016.05.010>
- IAEA. (1999). *Management of operational safety in nuclear power plants* (INSAG-13).
- ICAO. (2013). *Safety management manual (Doc 9859)* (3rd ed.). <https://www.icao.int/SAM/Documents/2017-SSP-GUY/Doc%209859%20SMM%20Third%20edition%20en.pdf>
- Kilic, B. (2019). HFACS Analysis for Investigating Human Errors in Flight Training Accidents. *Journal of Aviation*, 3(1), 28-37. <https://doi.org/10.30518/jav.553315>
- Kilic, B. (2021a). Fatigue Among Student Pilots. *Aerospace Medicine and Human Performance*, 92(1), 20-24. <https://doi.org/10.3357/AMHP.5631.2021>
- Kilic, B. (2021b). Self-Medication Among Ab Initio Pilots. *Aerospace Medicine and Human Performance*, 92(3), 167-171. <https://doi.org/10.3357/AMHP.5718.2021>
- Kilic, B. (2022). Impact of the COVID-19 Pandemic on the Mental States of Airline Pilots in Turkey. *Journal of Aviation*, 6(1), 50-54. <https://doi.org/10.30518/jav.1015567>
- Kilic, B., & Buyuksoy, E. (2022). Cancer Awareness Among Airline Pilots. *Journal of Aviation*, 6(3), 283-288. <https://doi.org/10.30518/jav.1062259>
- Kilic, B., & Gumus, E. (2020). Application of HFACS to the Nighttime Aviation Accidents and Incidents. *Journal of Aviation*, 4(2), 10-16. <https://doi.org/10.30518/jav.740590>
- Kilic, B., & Gundogdu, S. (2020). Human Factors in Air Cargo Operations: An Analysis Using HFACS. *Journal of Aviation Research*, 2(2), 101-114.
- Kilic, B., & Soran, S. (2019). How Can an Ab-Initio Pilot Avert a Future Disaster: A Pedagogical Approach to Reduce The Likelihood of Future Failure. *Journal of Aviation*, 3(1), 1-14. <https://doi.org/10.30518/jav.508336>
- Kilic, B., & Soran, S. (2020). Awareness Level of Airline Pilots on Flight-Associated Venous Thromboembolism. *Aerospace Medicine and Human Performance*, 91(4), 343-347. <https://doi.org/10.3357/AMHP.5493.2020>
- Kilic, B., & Tabak, M. (2022a). Presenteeism Among Ab-initio Pilots in Turkey. *Journal of Aviation*, 6(2), 180-186. <https://doi.org/10.30518/jav.1086578>
- Kilic, B., & Tabak, M. (2022b). The mental health of ab-initio pilots during the COVID-19 pandemic. *International Journal of Aeronautics and Astronautics*, 3(1), 20-27. <https://doi.org/10.55212/ijaa.1071166>
- Kilic, B., & Ucler, C. (2019). Stress among ab-initio pilots: A model of contributing factors by AHP. *Journal of Air Transport Management*, 80. <https://doi.org/10.1016/j.jairtraman.2019.101706>
- Li, Y., & Guldenmund, F. W. (2018). Safety management systems: A broad overview of the literature. *Safety Science*, 103, 94-123. <https://doi.org/10.1016/j.ssci.2017.11.016>
- Liao, M. Y. (2015). Safety Culture in commercial aviation: Differences in perspective between Chinese and Western pilots. *Safety Science*, 79, 193-205. <https://doi.org/10.1016/j.ssci.2015.05.011>
- Soeters, J. L., & Boer, P. C. (2000). Culture and flight safety in military aviation. *International Journal of Aviation Psychology*, 10(2), 111-133. https://doi.org/10.1207/S15327108IJAP1002_1
- Stolzer, A. J., Halford, C. D., & Goglia, J. J. (2008). Safety Management Systems in Aviation. In *Safety Management Systems in Aviation* (1st ed.). Ashgate. <https://doi.org/10.4324/9781351149648>
- Williamson, A. M., Feyer, A. M., Cairns, D., & Biancotti, D. (1997). The development of a measure of safety climate: The role of safety perceptions and attitudes. *Safety Science*, 25(1-3), 15-27. [https://doi.org/10.1016/S0925-7535\(97\)00020-9](https://doi.org/10.1016/S0925-7535(97)00020-9)



Appendix | Ek

Survey

- 1) Gender
 - a) Female
 - b) Male
 - c) Prefer not to say
- 2) Which of the following categories describes your age?
 - a) 17-23
 - b) 24-30
 - c) 31 and older
- 3) Holding type of license
 - a) Student pilot license-SPL
 - b) Private pilot license-PPL
 - c) Commercial pilot license-CPL
- 4) Does the curriculum of your organization (e.g., flight school, aviation faculty, flight training department, airline flight academy) include a course related to safety management and safety culture?
- 5) There is an open communication between management and student pilots about safety issues.
- 6) Management usually informs student pilots of incidents and their outcomes.
- 7) Safety information is brought to student pilots' attention by their managers/supervisors.
- 8) Management takes a personal interest in safety compliance.
- 9) Even due to financial pressures, safety takes priority.
- 10) If student pilots safety is at risk, managers halt operations.
- 11) Even if it means lost revenue, the management does not expect student pilots to ignore safety.
- 12) Management encourages fearless reporting of incidents, errors, and safety concerns.
- 13) Managers have open discussion with student pilots about safety issues.
- 14) Student pilots do not risk their jobs/trainings when they report safety concerns to management.
- 15) The knowledge gained from incident reviews is usually put into practice.
- 16) Management allocates resources to meet safety needs.
- 17) Management knows what goes on in operations.
- 18) Management does something about hazards before accidents can occur.
- 19) Most student receive adequate initial training to confidently do the job.
- 20) Student pilots do not face reprisal for raising safety issues.
- 21) The regulator's (DGCA) rules and policies are clear and simple to follow.
- 22) DGCA's audits are useful in ensuring safety.
- 23) You are clear about the difference in DGCA's safety and enforcement roles.
- 24) You believe accidents will happen no matter what anyone does.
- 25) Student pilots believe that luck plays a major role in aviation safety.



- 26) You believe everyone is likely to have an accident sooner or later.
- 27) Management takes disciplinary action against student pilots for regulatory noncompliance.
- 28) You have up-to-date software/technology to manage safety systems.
- 29) Student pilots receive recurrent training.
- 30) Judgement of 'safety at a reasonable cost' does not put people at risk.

