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Communications Between Team Members of Different Cultures and Nationalities on International Airline Flight Decks

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COMMUNICATIONS BETWEEN TEAM MEMBERS OF DIFFERENT CULTURES AND NATIONALITIES ON INTERNATIONAL AIRLINE FLIGHT DECKS

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International flight operations became commonplace in the 1950s with the introduction of jet transport aircraft. The new jets had speeds that were twice as fast as the piston aircraft they were replacing, a range great enough to transit oceans nonstop, and a lower operating costs that made international travel affordable to many more people.

For the most part, most of the pilots flying these aircraft were natives from the airline's home country. As international operations expanded exponentially, many airlines had difficulty finding native-born pilots to fly their aircraft. The human resource departments of many airlines began to recruit new pilots globally. While most of these airlines had programs in place to teach rudimentary crew resource management procedures, the bulk of the training the pilots received concerned the technical operation of the aircraft and the takeoff, enroute, and arrival operations the pilots could expect during actual line operations. Very little training was given to the pilots in how to communicate effectively with people from different cultures. In addition, many pilots and air traffic controllers had difficulty clearly speaking and understanding English, which is the international language of aviation. This has had a negative impact on flight safety during international flight operations.

This presentation will show the results of the experimental method, which was selected to test five hypotheses:
    1. Small group instruction techniques have no effect on improving authoritative/assertiveness interactions between pilots on culturally mixed flight decks.
    2. Small group instruction techniques have no effect on improving the decision-making capabilities between pilots on culturally mixed flight decks.
    3. Small group instruction techniques have no effect on improving trust between pilots on culturally mixed flight decks.
    4. Small group instruction techniques have no effect on interpersonal relationships between pilots on culturally mixed flight decks.
    5. Small group instruction techniques have no affect on improving the team atmosphere between pilots on culturally mixed flight decks.

The results of the experiment proved that training can improve the authoritative/assertiveness and team atmosphere characteristics of Asians and non-native English speaking pilots, and training can improve the interpersonal relationships and team atmosphere for Anglo and native English speaking pilots.

Proper administration of this training can lead to safer international flight operations.

Introduction

The deregulation of the United States airline industry by Congress in 1978 was the beginning of a revolution in the airline industry. Most aviation and consumer experts were of the incorrect belief that the affects of deregulation would be limited to the United States.

Before 1978, the United States airline industry was controlled by various agencies of the United States government (Taylor, 1964). These agencies set fares, determined schedule frequency, and determined which airline would serve which locations. The airlines were free to determine what type of aircraft they would use to fly the routes, and the service offered to the passengers on the ground and during flight. Since the airlines had no control concerning the fares and city pairs they served, competition between the airlines to fill their airplanes' seats created a level of service to the passengers served that would make their airline the most comfortable airline to fly.

October 26, 1958, was an historical day in international airline operations. Pan American World Airways began the first international non-stop jet service when it inaugurated flights between New York City and Paris (The Boeing Company). Before 1958, relatively slow propeller driven airplanes conducted nonstop, transoceanic service. A non-stop flight from London to New York required seventeen

hours (Airline History). The few airlines that offered this service were mostly piloted by members from their home country (e.g. aircraft flown by British Overseas Airways Corporation were piloted by British pilots; aircraft flown by Pan American World Airways were flown by pilots from the United States). Nearly all flight decks on international airliners were multicultural. The Boeing 707 required seven hours and forty minutes (Official Airline Guide). Affordable, rapid, comfortable international air transportation was now available with the advent of the new, long-range jet transport.

The intent of deregulation was to place the airline industry in the United States into the realm of free-market competition. The initial result of deregulation was the airlines' reevaluation of the routes flown and cities served. In an effort to minimize the effects of competition, most carriers segregated their route structures. This segregation allowed one airline to provide the majority of the air service into a particular city, and thereby dominate the fares in the markets involving that city. Without significant competition, the airline could set its fares based on its perception of what the market would bear.

In the early 1970s, just before the United States airline deregulation, a select few air carriers offered the majority of international service offered worldwide. Pan American World Airways, Trans World Airlines, and British Overseas Airways Corportation flew most of this service. After airline deregulation in the United Sates, several major United States airlines began to realize the importance of international service for increased profitability and continued expansion. In addition, aircraft manufacturers began to manufacture aircraft with the range and cargo capacity that could make international routes very profitable.

Foreign air carriers also began to increase their international operations. Malaysia-Singapore Airlines segregated in 1972 to create the two large Pacific carriers of Malaysia Air and Singapore Airlines (Singapore Airlines). British European Airways merged with British Overseas Airways Corporation in 1975 to form British Airways (Airline History). In 1983, United Airlines began operations between the United States and Tokyo. In 1985, United Airlines acquired Pan American Airways' Pacific Division (United Airlines, Era 7). Several other United States flag carriers including Northwest, Delta, and American began setting up an international route structure.

For the most part, most of the pilots flying these aircraft were natives from the airline's home country. As international operations expanded exponentially, many airlines had difficulty finding native-born pilots to fly their aircraft. The human resource departments of many airlines began to recruit new pilots globally. While most of these airlines had programs in place to teach rudimentary crew resource management procedures, the bulk of the training the pilots received concerned the technical operation of the aircraft and the takeoff, enroute, and arrival operations the pilots could expect during actual line operations.

Many of these aircraft were being operated with two or more pilots with different nationalities and different cultures. Additionally, language was a problem. While the international language of aviation is English, many air traffic controllers in non-English speaking countries used their native language instead of English. Additionally, before the introduction of culturally mixed flight decks, verbal communication between the pilots was usually conducted in their native language.

Flight operations with culturally mixed flight decks have created a plethora of problems, including language, a conflict of cultural norms, and the role of command/subordination on the flight deck.

Methodology

The experimental method will be selected to test the five hypotheses. Research done by Hanssen, Stayton, and Wlaka (1992) concerning multi-cultural considerations for space station training, and operational issues created by cultural differences that can pose potential safety problems (Helmreich, 2000) justify the need for this experiment. Using that data, the problems identified in the KLM/Pan American collision (National Transportation Safety Board, 1978) and the Flying Tiger 66 accident (Continental Airlines, 1989), current crew resource management practices (United Airlines, 1995), and my operational experience as a pilot teaching crew resource management to pilots from different cultures, the following cultural relationships will be measured:

1. Authoritativeness and assertiveness
2. Decision-making
3. Trust
4. Interpersonal relationships
5. Team atmosphere

Since industry implementation of the training will involve training culturally mixed and

monocultural crews in training centers located throughout the world, two groups will be used to test the hypothesis. The first group will involve the selection of an equal number of Anglo and Asian participants. While all the participants will speak English, one-half of the participants will be native English speakers, and the other half will be non-native English speakers. An expert in crew resource management training who possesses expertise in cross-cultural training (Hanssen et al., 1992) will administer the training. The second group will involve the performance of the experiment in an Asian country. The participants will be monocultural, and the trainer will be an expert in crew resource management training who possesses an archetypal expertise in cross-cultural training (Hanssen et al., 1992).

All participants will be given a pretest. The pretest will consist of two scenarios that are representative of situations international flight crews can experience (United Airlines, 1995). Each scenario will have 10 questions. The answers to these questions will be indicative of how well the participants will communicate with their fellow crewmembers by measuring their responses in the five cultural being measured in the hypotheses (Hanssen et al., 1992).

At the conclusion of the pretest, the training will begin. Based on my experience teaching crew resource management for 15 years, and the principles identified by Hanssen et al. (1992), the training will consist of training in:

- Communications principles as they relate to crew resource management and flight crews.
- A guided discussion on barriers to communication and suggested solutions.
- A discussion of three replayed scenarios viewed by the group on a television.
- The participants will then be grouped into pairs, mixing Anglo with Asian pilots, into two-men flight crews.

Each flight crew will fly an identical flight training scenario, which will involve an in-flight emergency. At the conclusion of the flight training scenario, each participant will be given a post test. The post test will consist of two scenarios, each of which will have 10 questions. The questions will measure the same five cultural relationships that will be measured in the pretest.

This type of training is representative of the type of crew resource management training given by

international airlines (United Airlines, 1995). The data will be collected from Anglo and Asian pilots, and from native English and non-native English speaking pilots. The answers to the pretest and post test questions will be given a numerical value. A value of one will be assigned to a strongly agree response; two for agree, three for uncertain, four for disagree, and five for agree. A higher number will indicate a more desirable position to effectively communicate.

A test for normality will be performed. If normality exists, a parametric test, such as a T test, will be applied. If normality does not exist, a non-parametric test, such as the Mann-Whitney U test, will be used. A non-parametric Sign test will be used to measure the difference in response between the pretests and the post tests to individual from the same culture. The statistical analysis of this data will determine if the training was effective in improving communications between team members of different cultures and nationalities on an international airline flight deck.

Experimental Results

Group One
Comparison of the Anglo and Asian Cultures

The purpose of this paper is to test the effectiveness of training to improve communications between team members of different cultures and nationalities on international airline flight decks. The communication skills were broken down into five areas: authoritative/assertiveness, decision-making, trust, relationships, and team atmosphere.

Prior to the beginning of the training, a comparison was made to assess the differences between the Asian and Anglos cultures by comparing their answers to the pretest questions.

Concerning authoritative/assertiveness, the Anglos and Asians were identical. This can be accounted for considering the common specific training, and the behaviors the pilots expected from the fellow crewmembers and air traffic control, that are given pilots worldwide flying transport category jet aircraft in international operations.

Decision-making had similar results. While both cultures were similar, the Asians had a slightly higher mean score. This is most likely accounted for by the higher Power/Distance Index (PDI) characteristic of Asian cultures when compared to Anglo cultures (Hofstede, 1991).

Concerning trust, the Asians had a higher value, in both the range of scores and the mean, in the pretest when compared to the Anglos. This can be explained by the higher Uncertainty Avoidance Index (UAI) characteristic of Asian cultures when compared to Anglo cultures (Hofstede, 1991). Cultures with a high UAI value tend to be set in their ways, skeptical of new thought and ideas. Cultures with a low UAI value are more open to new ideas, are more creative, and more willing to take chances.

The relationships between the crewmembers are very important for the team to function effectively. The Anglos and Asians were identical. This also can be accounted for considering the common specific training, that are given pilots worldwide flying transport category jet aircraft in international operations.

In the characteristic of team atmosphere, the Anglos had a higher range and mean than the Asians when comparing the pretests. The Individualism/Collective Index (IDV) characteristic of the Anglo culture is higher than those of the Asian cultures (Hofstede, 1991). A high IDV value represents a culture that places a reward for individual initiative, emphasizing the importance of individual thought and creativity. A low IDV value reflects a culture more comfortable working in groups. These results of the pretest contradict what can be expected by the IDV values. It would be expected that the lower IDV groups would have a higher team atmosphere. It may be possible that the strict training and importance of teamwork has a greater affect on the Anglos, causing them to have a higher score in team atmosphere.

Analysis of the Results of the Experiment

The results of the experiment had different results, depending on the hypothesis being considered.

Hypothesis 1: Small group instruction techniques have no effect on improving authoritative/assertiveness interactions between pilots on culturally mixed light decks. By comparing the pretest administered to the Anglos before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .302 indicated no difference between Anglo pretest and post test scores. For the Asian group, the hypothesis is rejected. The Sign Test value of .001 reflects an improvement in the authoritative/assertiveness characteristic. These results are reflective of the nature of the Asian culture. Asians cultures have a high PDI value. This indicates an acceptance of hierarchy as an important element of human behavior. Hence, proper training is more likely to affect a culture with a high PDI value in authoritative/assertiveness than a culture that places a lower emphasis on these values, such as the low PDI Anglos cultures.

Hypothesis 2: Small group instruction techniques have no effect on improving the decision-making capabilities between pilots on culturally mixed flight decks. By comparing the pretest administered to the Anglos before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .210 indicated no difference between Anglo pretest and post test scores. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is also supported. The Sign Test value of .077 indicated no difference between Asian pretest and post test scores. This can be explained by the fact that the training model was ineffective. Previous attempts at teaching decision-making have failed. Different cognitive skills are involved with teaching decision-making, with each individual responding to different cognitive skills, and past efforts at training general purpose cognitive skills have met with failure (Bransford, Arbitman-Smith, Stein & Vye, 1985).

Hypothesis 3: Small group instruction techniques have no effect on improving trust between pilots on culturally mixed flight decks. By comparing the pretest administered to the Anglos before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .210 indicated no difference between Anglo pretest and post test scores. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is also supported. The Sign Test value of .581 indicated no difference between Asian pretest and post test scores. These results can be explained by the fact that one cultural characteristic that is typical of all pilots is that they are highly individualistic in nature (Weiner et al., 1993, p. 68). This characteristic makes them wary of changing their trust in other pilots, thereby making it difficult to increase their trust in other pilots.

Hypothesis 4: Small group instruction techniques have no effect on interpersonal relationships between pilots on culturally mixed flight decks. By comparing the pretest administered to the Anglos before the training with the post test administered after the training, this hypothesis is rejected. The Sign Test value of .007 reflects an improvement in the interpersonal relationships between pilots. These results are reflective of the nature of most Anglo

cultures. Anglo cultures tend to have a high IDV value. This represents a culture that places a reward for individual initiative and favors individual initiative over group activity (Hofstede, 1991). Hence, proper training is likely to improve an individual with high IDV values. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of 1.00 indicates no difference between pretest and post test scores. Most Asian cultures have a low IDV value (Hofstede, 1991). Individuals from these cultures prefer group activity to individual activity, so are more likely to have good interpersonal relationships before the training, making this characteristic more difficult to improve.

Hypothesis 5: Small group instruction techniques have no affect on improving the team atmosphere between pilots on culturally mixed flight decks. Most Anglo cultures favor individualism, and most Asian cultures favor collectivism (Gudykunst, 1994). It could be inferred that Anglo cultures would be more likely to improve in the characteristic of team atmosphere that Asians. Such is not the case. By comparing the pretest administered to both Anglos and Asians before the training with the post test administered after the training, this hypothesis is rejected for both the Anglos and the Asians. The Sign Test for the Anglos was 0.000, and for the Asians the Sign Test was .013. This indicates a successful training program in improving team atmosphere for both cultures.

Group Two
Analysis of the Results of the Experiment

Hypothesis 1: Small group instruction techniques have no effect on improving authoritative/assertiveness interactions between pilots on culturally mixed light decks. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is rejected. The Sign Test value of .031 reflects an improvement in the authoritative/ assertiveness characteristic. These results are reflective of the nature of the Asian culture. Asians cultures have a high PDI value. This indicates an acceptance of hierarchy as an important element of human behavior. Hence, proper training is more likely to affect a culture with a high PDI value in authoritative/assertiveness than a culture that places a lower emphasis on these values, such as the low PDI Anglos cultures.

Hypothesis 2: Small group instruction techniques have no effect on improving the decision-making capabilities between pilots on culturally mixed flight decks. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .375 indicated no difference between Asian pretest and post test scores. This can be explained by the fact that the training model was ineffective. Previous attempts at teaching decision-making have failed. Different cognitive skills are involved with teaching decision-making, with each individual responding to different cognitive skills, and past efforts at training general purpose cognitive skills have met with failure (Bransford, Arbitman-Smith, Stein & Vye, 1985).

Hypothesis 3: Small group instruction techniques have no effect on improving trust between pilots on culturally mixed flight decks. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .375 indicated no difference between Asian pretest and post test scores. These results can be explained by the fact that one cultural characteristic that is typical of all pilots is that they are highly individualistic in nature (Weiner et al., 1993, p. 68). This characteristic makes them wary of changing their trust in other pilots, thereby making it difficult to increase their trust in other pilots.

Hypothesis 4: Small group instruction techniques have no effect on interpersonal relationships between pilots on culturally mixed flight decks. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .063 indicates no difference between pretest and post test scores. Most Asian cultures have a low IDV value (Hofstede, 1991). Individuals from these cultures prefer group activity to individual activity, so are more likely to have good interpersonal relationships before the training, making this characteristic more difficult to improve.

Hypothesis 5: Small group instruction techniques have no affect on improving the team atmosphere between pilots on culturally mixed flight decks. By comparing the pretest administered to the Asians before the training with the post test administered after the training, this hypothesis is supported. The Sign Test value of .219 indicates no difference between pretest and post test scores. Again, most Asian cultures have a low IDV value (Hofstede, 1991). Individuals from these cultures prefer group

activity to individual activity, so are more likely to have good team atmosphere prior to beginning the training, making an improvement in this characteristic more difficult.

Conclusions

In all experimental scenarios, all Anglos were native English speakers, and all Asians were non-native English speakers. Hence, the following conclusions can be made:

Hypothesis 1: Small group instruction techniques have no effect on improving authoritative/ assertiveness interactions between pilots on culturally mixed light decks. Training can improve this characteristic for Asians and non-native English speakers. Training cannot improve this characteristic for Anglos and native-English speakers.

Hypothesis 2: Small group instruction techniques have no effect on improving the decision-making capabilities between pilots on culturally mixed flight decks. Training cannot improve this characteristic for Asians, non-native English speakers, Anglos, or native English speakers.

Hypothesis 3: Small group instruction techniques have no effect on improving trust between pilots on culturally mixed flight decks. Training cannot improve this characteristic for Asians, non-native English speakers, Anglos, or native English speakers.

Hypothesis 4: Small group instruction techniques have no effect on interpersonal relationships between pilots on culturally mixed flight decks. Training cannot improve this characteristic for Asians and non-native English speakers. Training can improve this characteristic for Anglos and native-English speakers.

Hypothesis 5: Small group instruction techniques have no affect on improving the team atmosphere between pilots on culturally mixed flight decks. In a culturally mixed training environment, training can improve this characteristic for Asians, non-native English speakers, Anglos, and native English speakers. In a monocultural training environment,

training cannot improve this characteristic for Asians or non-native English speakers. This can be explained by the intercultural communication that occurs in the training environments where the cultures are mixed, and the lack in intercultural communication that occurs in a monocultural training environment.

The only advantage to the Asian pilots in comparing the results of the training to the pilots of mixed cultures, Group 1, to the training of monocultural pilots, Group 2, is the improvement in team atmosphere to the training administered to the culturally mixed group. Two factors may have affected this outcome. Since an experienced airline instructor did the monocultural training to pilots from that one, specific airline, there may have been some conflicts of training with established company policies. This further enhances the need for corporate organization and philosophy to be supportive of goals of intercultural training. Secondly, the pilots from Group 1 were all very experienced line pilots with years of operational experience in multi-pilot aircraft. This may make improving team atmosphere more difficult since those pilots are more "set in their ways" of doing things.

It can be concluded that training in improving communications between team members of different cultures and nationalities on international airline flight decks is successful in improving relationships and team atmosphere in Anglo, native English speaking cultures, and in improving authoritative/assertiveness and team atmosphere in Asian, non-native English speaking cultures.

It can be concluded that training in improving communications between team members of different cultures and nationalities on international airline flight decks is not successful in improving authoritative/assertiveness, decision-making skills, and trust in Anglo, native English speaking cultures, and is not successful in improving decision-making skills, trust, and relationships in Asian, non-native English speaking cultures.

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