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Individual Factors on Readiness of Youth Fishermen in Malaysia to Use Global Positioning Systems

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Abstract: The main aim of this study is to identify the individual factors that might impinge young (aged between 15-40 years old) fishermen's readiness to use Global Positioning Systems (GPS) at sea. The study was quantitative in nature and via a multi-stage simple-random sampling, a total of 240 young fishermen from four selected fishing districts have been selected as the respondents. In general, the young fishermen were moderately ready to use the GPS at sea. The inferential analyses performed have confirmed that the factors of education level and catchment area have recorded significant difference with readiness for GPS usage while factors of age and number of crew members have recorded a positive and significant relationship with readiness for GPS usage. A number of recommendations have been discussed and it is hoped that such recommendations will assist the relevant parties in developing strategies to enhance usage of fishing technologies among fishermen in Malaysia-particularly the younger ones.

Key words: Youth fishermen, readiness, GPS, community development

INTRODUCTION

The fishing industry is an important branch of Malaysian agriculture and its role in strengthening the socio-economic aspects of the community, particularly those communities that have settled in rural areas, cannot be denied. Today, there are 134,110 registered fishermen in Malaysia compared to 129,622 in 2010 and 125,632 in 2009 (DFM, 2012). The increase in this number is the result of a number of efforts made by the government in recent years, especially the introduction of an allowance of RM200 (roughly equivalent to USD66) per month for each registered fisherman and the introduction of a fuel/diesel subsidy for fishermen, which enables them to buy cheaper fuel/diesel. Interestingly, such efforts have managed to attract interest from the community particularly the younger generation to register themselves as a fisherman. To date, there has been no official count of the number of registered young fishermen in Malaysia. However, based on the consistent findings from previous studies, those who constitute as 'youths' make up more than 30% of registered fishermen in Malaysia (Shaffril *et al.*, 2013; Ramli *et al.*, 2013; Omar *et al.*, 2012).

The use of technology in fishing operations in Malaysia varies widely and is influenced hugely by catchment area and type of vessel. Zone A fishermen, who conduct their fishing operation at the coastal areas

and use smaller vessels usually use mobile phone and GPS technology while Zone B, Zone C0 and Zone C2 fishermen, who conduct their fishing operations at deeper-sea areas usually rely on GPS, echo sounding, remote sensing, wireless set and radar for their fishing operations. Mazuki *et al.* (2013) and Ramli *et al.* (2013) have confirmed that mobile phone was the preferred technology among the fishermen in their fishing routine due to their affordable price, perceived ease of use and perceived usefulness. However, Omar *et al.* (2012) have raised the concern that only a small portion of fishermen use advanced technology such as GPS and echo sounder in their fishing operations, which leaves us with a question: Are the majority of fishermen in Malaysia not ready to use advanced fishing technologies in their fishing operations? This study therefore aims to explore two major questions: First, to identify the level of readiness among young fishermen in Malaysia to use GPS in their fishing operations and second, to determine the individual factors that might impinge their readiness to use GPS in their fishing operations.

Compared to the more traditional methods of fishing, GPS indeed offers several superior benefits to the user. Firstly, fishing operations are conducted over the vast areas of seascape, so it is almost impossible for fishermen to remember the exact location of their catchment areas. However, GPS enables fishermen to save the coordinates

of their catchment areas, to which it will navigate them on future expeditions. Second, it is common for fishermen to be struck by bad weather which can sometimes affect their vision and thus obstruct them from returning safely to the jetty. However, GPS will navigate them and their vessel safely to the jetty. Furthermore, through these direct benefits, GPS also offers a number of indirect benefits that profit the socio-economic status of the fishermen. First, because the GPS is able to navigate fishermen to their exact catchment areas, it helps them save time. A shorter operation time means that fishermen can cut a number of costs, especially those of fuel, crew members' pay and ice. Second, GPS helps fisherman feel safer in their fishing operations, as it can assist a safe return to the jetty, even in bad weather. Third, GPS warns fishermen if their vessel is approaching any dangerous coral which can avoid damage to their vessels. Furthermore, GPS warns fishermen if their vessel is approaching international boundaries helping them avoid conflict with foreign fishermen.

METHODOLOGY

This study used a developed questionnaire to collect the required data. The construction of the questionnaire was based on a review of literature and questions of past studies. Except for demographic data which requires open-ended or closed-ended answers, the other questions provide a five Likert-like scale for respondents, ranging from one (strongly disagree) to five (strongly agree). After completion, the questionnaire was then pre-tested among 30 young fishermen at Kuala Terengganu and Kuala Paka. The resulting Cronbach Alpha value was 0.869 which exceeded the value of 0.700 recommended by Nunnally (1978). After completing the pre-test process, the study was progressed to actual data collection which involved a total of 240 respondents among young fishermen, who were selected via a multi-stage simple-random sampling. The data collection was conducted at four fishing districts in Malaysia, namely Kuala Besut, Mersing, Langkawi Island and Pangkor Island. The data collection was assisted by trained and experienced enumerators and was monitored by the researchers. Descriptive analyses such as frequency, percentage and mean score were performed to describe the general data of the study while inferential analyses such as ANOVA and Pearson product-moment correlation were performed in order to identify any differences or relationships that might occur between the independent variables and the dependent variable.

RESULTS AND DISCUSSION

Table 1 demonstrates the demographic data of the respondents. With regard to gender, a huge majority of the respondents were male (98.8%), although, such data is not surprising, as it is in line with studies conducted by Shaffril *et al.* (2013), Omar *et al.* (2012), Mazuki *et al.* (2013), Bolong *et al.* (2013) and Gidarakou (1999) added that scenarios in agriculture, wherein the number of males far exceeds the number of females, due to the physical demands of the job and high family commitments among the female population. The mean score for age was 31.3, years with more than two thirds of respondents being included in the age group of 36-40 years old. A total of 34.6% of respondents possessed an education level of

Table 1: Respondents' demographic data

Variable	Frequency	Percentage	Mean
Gender			
Male	237	98.8	
Female	3	1.2	
Age (years)			
<25	62	25.8	31.3
26-30	44	18.3	
31-35	42	17.5	
36-40	92	38.3	
Education level			
Never been to school	21	8.8	
Primary school	61	25.4	
PMR/LCE/SRP	64	26.7	
SPM/MCE/SPMV	83	34.6	
Tertiary level	11	4.5	
No. in household			
1-3	56	23.3	
4-6	126	51.3	
>6	58	25.4	
Income (from fishing activity) (RM)			
<500	55	22.9	941.5
501-750	46	19.2	
751-1000	91	37.9	
>1001	48	20.0	
Experience as a fisherman (years)			
<5	68	28.3	12.2
6-10	48	20.0	
11-15	46	19.2	
>16	78	32.5	
No. of crew members			
0-1	71	29.6	
2-3	106	44.2	
4-5	16	6.6	
>5	47	19.6	
Days per month spent fishing			
<15	75	31.3	18.7
16-20	85	35.4	
21-30	80	33.3	
Catchment area			
Zone A	161	67.1	
Zone B	46	19.2	
Zone C0 and C2	33	13.7	

PMR/LCE/SRP: Malaysia lower certificate of education, SPM/MCE/SPMV: Malaysia certificate of education and Malaysia certificate of vocational education

at least SPM/MCE/SPMV while only 4.5% possessed a tertiary-level education. We can conclude that this is so because, as Gidarakou (1999) has claimed, those with a higher level of education have less interest in agriculture, as they consider it to be a ‘second class’ job that does not offer them a high income. Slightly more than half of the respondents (51.3%) have four to six household members and while it is good to know that a mean score for average income per month was recorded as RM 941.5 (roughly equal to USD 313.5) which exceeds the poverty level set by Economic Planning Unit of Malaysia (RM 720 (roughly equivalent to USD 240)). However, the revelation that some of them (22.9%) still earn below RM 500 (roughly equivalent to USD 167) per month raises some concerns. The majority of the respondents can be considered as ‘senior’ fishermen, as most of them (32.5%) possessed more than 16 years’ experience. Most of the respondents have 2-3 crew members within their vessels, while the mean score recorded for days spent at sea for fishing activities was 18.7. More than two thirds of the respondents were Zone A fishermen. To gain the overall mean score for readiness, the cumulative mean score of fishermen’s readiness, self-readiness, infrastructure readiness and agencies readiness have been calculated. The resulting mean score of 3.38 shows that the respondents possessed a moderate level of readiness for using GPS at sea. Further analysis was then performed to identify the mean score of each aspect of readiness, from which it can be concluded that two readiness aspects, namely fishermen readiness (perception of the respondents towards other fishermen readiness to use GPS) and self-readiness (perception of respondents on their readiness to use GPS), recorded a high mean score, while the remaining two aspects, namely infrastructure readiness and agencies readiness, recorded a moderate mean score. It is encouraging to discover through conducting this research that fishermen themselves are ready to use advanced technologies like GPS, because it will support the government’s aim of transforming fishermen into a higher earners. These findings also indicate that, should the government intend to implement any fishing technology programs, particularly one that is GPS-related, such programs are highly likely to be welcomed by the fishermen. Nonetheless, their level of readiness might be hindered by the moderate readiness of infrastructure and agencies. Perhaps agencies can play a more proactive role by offering more technology-related programs to fishermen. Courses, seminars and training would be useful in enhancing fishermen’s skill in and compatibility with technology (Omar *et al.*, 2012) while supporting infrastructure such as workshops (e.g., in how to repair a broken GPS system) and good signal strength for example can further support their readiness towards technology usage (Table 2 and 3).

Table 2: Overall readiness to use GPS

Level	Frequency	Percentage	Mean
Overall readiness			3.38
Low (1.00-2.33)	-	-	
Moderate (2.34-3.67)	156	65.0	
High (3.68-5.00)	84	35.0	

Table 3: Aspects of readiness

Aspects	Mean score
Fishermen readiness	3.80
Self-readiness	4.09
Infrastructure readiness	2.86
Agencies readiness	2.75

Table 4: Individual differences in readiness to use GPS at sea

Variables	N	Mean	SD	F	p
Level of education					
<Primary school	82	3.21	0.619	5.700	0.004
PMR	64	3.38	0.614		
>SPM/SPMV	94	3.52	0.588		
Catchment area					
Zone A	161	3.38	0.616	5.869	0.004
Zone B	46	3.18	0.529		
Zone C	33	3.64	0.654		

In order to examine any differences that might occur between readiness to use GPS at sea and education level and catchment areas, ANOVA was performed. For the purpose of the analysis, the level of education was regrouped into three categories: those who had never been to school and therefore possessed a primary level of education were assigned to the <primary education category; those who possessed a PMR level of education were assigned to the PMR category and those who possessed an SPM/SPMV and tertiary level of education were assigned to the >SPM/SPMV category. The results demonstrated, F value (3, 240) = 5.700, p<0.05 confirmed that there was a significant difference between the groups studied: Those fishermen who had been educated to a higher level possessed a better level of readiness compared to those who had been educated to a lower level. However, these findings were not a surprise, as they are in line with a number of existing studies (Magwizi, 2005; Meso *et al.*, 2005; Saunders, 2004). The ANOVA was also then performed to identify any differences between the groups studied in terms of their catchment areas. The results (F value (3, 240) = 5.869, p<0.05) demonstrated that there was a significant difference. Again, such results were not surprising, due to the fact that deep-sea fishermen (Zone C) have a greater need to use advanced technologies, particularly with regard to marking catching areas and enhancing safety (Table 4), among other reasons.

To identify any relationship that might occur between readiness to use GPS and selected independent variables, the Pearson product-moment correlation was employed. The analysis shows that two independent variables, namely age and number of crew members, recorded a positive and significant relationship with readiness to use GPS. It is uncommon for studies to reveal a positive

Table 5: Relationship with readiness to use GPS at sea

Variables	R	p
Age	0.153	0.017
Income	0.034	0.605
Experience	-0.044	0.493
Days per month spent at sea	0.005	0.937
No. of crew members	0.176	0.006

correlation between technology use and age, many local studies have reflected contradictory results (Shaffril *et al.*, 2010; Samah *et al.*, 2009; Hassan *et al.*, 2009). However, within the context of youth studies in Malaysia, this study manages to prove that, as a youth approaches adulthood, he/she is expected to express a better readiness for technology use (Omar *et al.*, 2012). The positive correlation between readiness and the number of crew members can be explained by the power of social influence among the fishermen. According to Mazuki *et al.* (2013), fishermen's colleagues are among the most biggest social influences among fishermen, resulting from their daily communication and the spirit of togetherness in doing group tasks related to their fishing activities (e.g., repairing nets, cleaning their vessels). The other three independent variables, namely income, experience and days spent at sea, did not record any significant relationships with readiness to use GPS (Table 5).

CONCLUSION

The fishing industry is expected to face a formidable challenge in the future, as the sustainability of marine supplies is threatened by problems like overfishing and climate change. However, a greater reliance on advanced fishing technologies like GPS can be one of the best courses of action. The government has already supported this alternative but the question has been raised: Are today's young fishermen, the future generation of the fishing industry, ready to use fishing technologies? The results gathered in this study demonstrate that fishermen themselves are indeed ready to employ advanced technologies within their fishing operation; however, such readiness can be further enhanced if support from infrastructure and agencies, for example, are consistently provided to them.

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