Basic skills that to be possessed by a research person

V.Kulathunga

Deputy Director of Education
Science Branch,
Ministry of Education, Sri Lanka

Abstract : The aim of this study was to identify the basic skills expected of researchers in the public and private sectors. In order to identify the skills, a postal survey questionnaire was designed, including the main basic skills. The questionnaire was sent to the heads of the research sections of 150 purposefully selected public sector organizations and 100 purposefully selected private sector organizations. There were variations in the observed facts and skills of the researchers at the responding institutions. Chi-square analysis showed that there were significant (P<0.05) associations between the two sectors and industries that the organizations are involved in. The educational qualifications, selected computer packages, and English knowledge were significantly associated. There was a significant relationship between the two sectors and the research person's skills. The need for computer literacy for the researchers and skills on basic research techniques had no significant association with the sectors. The study revealed that basic skills such as research design, data collection, data analysis, report writing, seminar presentations, literature studies, and basic computing skills related to these activities are expected of research personnel in both public and private sector organizations involved in manufacturing, selling, education, research and development, public service, consulting, electronic media, housing, advertising, management, and financing industries and services. Therefore, these can be included in a curriculum designed to provide basic training for the researchers. Finally, the research skills among the researchers in both sectors were low.

1.   Introduction

The research culture has expanded into every field in Sri Lanka, and it has been highly diversified. The diversification and spread of research culture has been so intense that several bodies have been established for funding and coordinating the research activities. These bodies are mainly state-sponsored institutions and are primarily involved in coordinating and funding research activities. Although research activities are going on in the private sector, they are not as prominent as in the public sector.

There are several disciplines with respect to research activities in Sri Lanka, and they include the natural sciences, engineering technology, medical sciences, agriculture, social sciences, humanities, and some others. The total government expenditure for the research and development activities in these disciplines has been Rs. 1,492.61 million in the year 2000, and this amounts to 0.19% of the gross domestic product for the year (Central Bank of Sri Lanka, 2012). According to the National Science Foundation of Sri Lanka (2012), the total manpower involved in research activities as research and development scientists was 13,779 in 2000. In addition to the universities, which carry out a considerable amount of research, there are 21 research and development institutions operating under the sponsorship of the government. Besides these, there are other public and private organizations that carry out research relevant to their own policies and programs. Findings resulting from all these research activities are used to design or modify the development programs or policies of these institutions or to introduce new knowledge to society.

When the reports of the research carried out by these institutions are examined, it reveals that some of these researches have not been carried out scientifically. One of the main reasons for this is that these researchers lack the basic skills needed to carry out scientific research. When the findings of these unscientific researches are used to design or modify programs, they do not achieve the anticipated results and often fail, causing a waste of large sums of money, time, and energy. On the other hand, when students, like academicians lacking basic research competencies, engage in research activities related to their studies, they cannot complete them on time (Council, 2003). Further, as a result of the negligence of the supervisors, these postgraduate students are not able to acquire research skills from them.

One way to avoid these losses is to train the personnel involved in research activities to give them basic skills so that they can carry out scientific research (Frank & Althoen, 1996). Although there are organizations that coordinate and fund research activities in Sri Lanka, they have failed to implement a properly organized research program due to a lack of competence.

Research problems

1. What extent to competent for conducting researches?
2. What are the basic skills one needs to have for researching?

The objectives of the study were,

1. To determine the level of competence among researchers
2. To identify the basic research skills that a competent researcher has to have

Limitations of the study

The study limited itself to only the basics, such as computer knowledge (Office Package, SPSS, Minitab, the Internet, and email), research methodologies (research designing, data collection, analysis of data, report writing, literature surveys, and seminar presentations), evaluation of research works, and English language skills related to writing and presentation. The statistical analysis of the data was limited to testing whether there is a sector dependence on the facts identified in the study.

2. Methodology and Results

The study was of the survey type and used quantitative and descriptive methods for analyzing the data. A questionnaire was designed by inserting the basic skills that researchers have. The sample was selected by the heads of the research sections, and they purposefully selected 150 public-sector organizations and 100 private-sector organizations. The pilot study was done to test whether the questionnaire was understood by the respondents as anticipated. The unit of analysis was the head of research in both the public and private sectors.

Results

The responses obtained for each question have been given as frequencies in graphical form. As it is known that the public sector and private sector are different from each other, it is important to investigate whether the facts revealed by the study vary with the sector. Since these facts will be used to confirm or amend the training given to the researchers in both sectors together, if all factors vary between the two sectors' research, designing a common training program won't be applicable. According to the given responses, the responding organizations were classified as either public or private. The responders from government and semi-government organizations were placed under the public sector, while those from private and non-governmental organizations were placed under the private sector. The association between the two sectors and each response category was tested using a chi-square test in the SPSS 19 software to determine whether these facts vary with the sector. P values ≤ 0.05 were considered significant, while those ≤ 0.01 were considered as highly significant.

Out of the sample, there are 117 responses from the government sector and 47 responses from the private sector. The responding institutions were: manufacturing: 20, distribution: 10, selling: 15, education: 30, research and development: 71, and other: 18. The distribution category showed the lowest response rate, and the research and development category showed the highest response rate. The types of research teams in the responding institutions were permanent and temporary. The freedom to do research was highest among the research team but not among the other staff. So it's reflect discouraging person to involve in researches, when they are not in a research team. When analyzing the need among the responses, more than 156 responses mentioned that computer literacy skills are needed for research, and only 8 responses mentioned that they are not needed.

Table 1: The tasks of the researchers in the responding institutions

	The tasks of the researchers	number of responses
01	Research design	144
02	Collection of Data	155
03	analysis of data	160
04	Report writing	149
05	collection of literature	135

Table 2: Level of English knowledge of the researchers in the responding institutions

	The level of English knowledge	number of responses
01	Good written	30
02	Good speech	22
03	both at a moderate level.	51
04	Both at a higher level	61

The willingness of the responding institutions to see their researchers follow research training shows that more than 134 institutions are willing and the rest are not interested in the research training. Most institutions acquire research training according to their needs.

The chi-square analysis of the data showed a highly significant association between the two sectors and the industries they involve, indicating that the industrial activities of the organizations are dependent on the sector. There was no significant relationship between the two sectors' research teams being permanent or temporary and their research skills. This indicates that the nature of the research teams and their skills are independent of the sector. The freedom to do research for their non-research staff was not significantly different between the public and private sectors. There was a highly significant relationship between the two sectors in terms of the educational qualifications that their researchers are expected to possess. This reveals that the educational qualifications expected are dependent on the sector. The relationship between the two sectors and the need for computer literacy wasn't significant, and therefore the relationship is sector-independent. There is a significant relationship between the two sectors and the knowledge of the selected software, which is expected to be known through the research of institutions. There was not a significant relationship between the tasks of the researchers involved and the sectors. That indicates the tasks of the researchers are independent of the sector. The level of English language skills of the researchers had a significant relationship with the sector. The possessed skills for research were not significantly related between the two sectors. The researchers are doing some additional duties such as management, technical services, evaluation work, production, and others Norman (2005). The additional duties of researchers are low in the production field. There was not a significant relationship between the sectors and the competence level of researchers.

3. Discussion

There are a large number of people involved in research activities in various fields in Sri Lanka. These researchers have different skills related to their research activities. However, when the research reports of certain researchers are examined, it reveals that many of the researchers are still lacking the basic skills that any researcher should have in order to carry out research scientifically. As a result, carrying out unscientific research and using the findings of that research for policy, program planning, and implementation are not reliable. This causes a huge waste of money, time, and energy intended for spending on the development of the country.

The results show that the researchers in Sri Lankan public and private sector organizations are involved in research related to understanding, distribution, selling, education, research & development, and others such as public service, consultancy, media, housing advertising, management, and financing services. The sector dependence of the industry or service involved reveals that the research fields they involve in research activities are different from each other in the public and private sectors. The sector independence of the research teams being permanent or temporary indicates that regardless of being government or private, both sectors have temporary and permanent research teams. The temporary nature of the research team is also a barrier to the progress of the research activities. The scope for non-research staff to do research is a positive indication revealed by the sector's independence and the freedom of both research and non-research staff to engage in research (Osadebe, 2014). The freedom for non-research staff to do research can inspire them to follow research training and acquire the skills to do scientific research. For this purpose, there should be organized research training. The basic research skills needed by the researchers are not different between the two sectors, as revealed by the sector-independent tasks of the researchers. The basic educational level of researchers can change according to the sector, and the researchers in both sectors should have a good basic education, which is helpful to make good observations and carry out analytical works that are vital in research activities.

Irrespective of the sector, the researchers have to have computer literacy, as indicated by the sector independence need for computer literacy, revealing that they are expected to use computers during research activities (Osadebe, 2014). The use of information technologies reduces time and increases the efficiency of research activities. This suggests that including information technology training in both sectors is highly important. If the level of proficiency in handling statistical software is high, it will be an additional benefit for successful researchers.

As revealed by the sector-independent task performed by the researchers, the skills required to perform tasks are necessary for the researchers in both sectors. With regard to the English knowledge, there was a sector-dependent need, indicating the level of the researchers can vary according to the sector. However, the researchers in both sectors should possess good English knowledge so they can acquire modern knowledge to improve their research (Panneerselvam, 2014). The competence level of researchers for research is independent of the sector. Both sectors should possess a high level of research competence among researchers to conduct successful research. Properly designed training programs are needed for both sectors' researchers. The additional duties of researchers can reduce their availability and efficiency.

4. Conclusions

The study reveals that the levels of research skills among the majority of researchers are not high in both sectors, and all researchers need to improve their research skills through organized training programs. The basic skills identified were research design, data collection, data analysis, report writing, literature survey, presentation, and evaluation of works. Information technology is an advancement for researchers. Competencies in statistics and office software are needed to develop among the researchers. The knowledge of English can impact self-efficacy in researching, and the abilities to perform additional duties can negatively impact research performances.

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