Full Length Research Paper

Biotechnology issues in four Malaysian mainstream newspapers

Mus Chairil Samani[1,2], Nurul Ilyana Rezali[1,3], Latifah Amin[1,4*] and Zaharah Hassan[1,4]

[1]Social Impact of Biotechnology Development in Malaysia Research Group (SIMBIO), Universiti Kebangsaan Malaysia, Bangi 43600, Malaysia.
[2]Faculty of Social Sciences, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia.
[3]Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia, Bangi 43600, Malaysia.
[4]Centre for General Studies, Universiti Kebangsaan Malaysia, Bangi 43600, Malaysia.

Biotechnology has been identified as the new engine of growth for the transformation of Malaysia into a developed nation by 2020. The objective of this paper is to analyze the impact of National Policy on biotechnology on media reporting in four Malaysian newspapers. Towards this end, a content analysis of four Malaysian mainstream newspapers (that is, Utusan Malaysia, Berita Harian, New Straits Times and The Star) over ten years period was conducted. The findings showed that the coverage pattern among the four different mainstream newspapers were different. These findings indicated that the mass media can be a tool for educating the public but it can only be done through the publishing of in-depth articles discussing issues relating to biotechnology. In conclusion, we found that the media has been unsuccessful in its role to teach the public on biotechnology. In this regard, the government will have to take some other measures to educate the public on that issue. Such immediate steps are necessary because it has been more than five years since the announcement of the National Policy on Biotechnology but the interest among Malaysians on biotechnology is still lacking.

Key words: Biotechnology, Malaysian mainstream newspapers, National Policy on Biotechnology, genetically modified food (GMF).

INTRODUCTION

The Malaysia government sees the importance and influential role of newspapers in disseminating information to the general public. It also allows readers to share their ideas and views which will contribute towards a better perception and understanding of the technology. Chamil (2010) argued that newspapers could become a medium for public to voice out their opinions and views because they have the power to communicate important issues to the general public (Dudo et al., 2011; Macer, 2000). Owners of newspapers have always realized this when highlighting important issues affecting the general public. They can better understand issues that have a direct and profound impact on their life (Chamil et al., 2010; Bauer, 2005).

McCombs and Shaw (1972, 2004), Viella-Vila and Costa (2008), Macer (2001) and Wingenbach et al. (2006) argued that, the media does not directly influenced people's mind but focuses the public attention on selected reported issues. If the media focuses on a particular issue or story that is important, it will become an important issue being discussed by the community. McCombs (2004) states that the public uses issues focused by the media and create their own agenda by selecting which issue that is more important. By creating a topic in the community, topic in the public agenda will exist which in turn becomes the main focus of the public to discuss or debate an issue actively.

Dudo et al. (2011) did a study on food nanotechnology in US newspaper which pointed the media as the public's primary source of information and plays an important role

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*Corresponding author. E-mail: nilam@ukm.my Tel: +6019-2726182. Fax: +603-89252976.

Abbreviations: **GMF**, Genetically modified food; **GMO**, genetically modified organisms.

in shaping the awareness among public (Vanderschuren et al., 2010; Holmgreen and Vestergaard, 2009; Torres et al., 2006; Matthews et al., 2003; Morris and Adley, 2001). Results were analyzed using a comprehensive sampling technique and analysis to examine the coverage trends, authorship patterns and thematic emphases between January 1, 1980 and 31 December, 2009 in 21 different US daily newspapers. From the analysis, coverage on food nanotechnology (n = 206) in US newspaper was relatively modest based on how frequent the issues have been covered, its thematic diversity, and the level of journalistic expertise from which it was produced. This study was the first to empirically assess journalistic coverage on food nanotechnology.

Smeltzer (2008), only one researcher who did a study on the biotechnology issues in alternative media in Malaysia found that the coverage of biotechnology issues is absolutely limited. In discussing this issue, she said that the mainstream media do not have the freedom to cover any issues. Smeltzer writes rather critically and attacks on the government policies clearly show her negative view about the media in Malaysia and stating that, the media focus only on government agendas which are issues relating to politic and economic. Thus, the media never seriously consider reporting of other issues, especially, biotechnology issue. As a result, the media is busy reporting the two main issues without looking at biotechnology issue which is of importance to meet the needs of the Malaysian community. The scenario in Malaysia is different. The media only began to focus on biotechnology issues after the Malaysian government announced the launching of the National Biotechnology Policy on 28th April, 2005. The Policy was formulated by the Malaysian government to spearhead the development of biotechnology as an important area of growth. The government realized that the country rich natural resources can be fully harnessed with the input of biotechnology. Thus, the objective of this paper is to analyze the trend and coverage of biotechnology issues in four Malaysian newspapers.

MATERIALS AND METHODS

Content analysis was used to analyze media coverage of biotechnology issues in four mainstream newspapers in Malaysia (Utusan Malaysia, Berita Harian, New Straits Times and The Star). These four mainstream newspapers were chosen for this study because; the majority of the reading public preferred these newspapers (Michelle, 2008). Content analysis was chosen because it allows the researcher to determine the type of content published. Content analysis is defined as a systematic method to identify the content of the recorded information (Walizer and Wiener, 1978). This is supported by Krippendorf (1980) who argued that this method is the best research technique for the studying and analyzing of communications because of its systematic, objective and quantitative nature.

These three characteristics require uniformity in the process of coding and analysis of items, which involve the construction of coding books and sheets to carry out the studies (Hansen, 2008; Wimmer and Dominick, 1991). The coding book contains the opera-

tional definition of every variable in order to obtain consistent and precise results. Objectivity will ensure that personal bias of researchers is excluded in the process of coding and analyzing the results. Statistical analysis was used in interpreting and analyzing of data (Hansen, 2008, Wimmer and Dominick, 1991). In maintaining and ensuring reliability of coding, the inter-coder reliability tests were carried out using Holsti formula (1969). An inter-coder reliability score of above 9 was obtained in this study. Two researchers were involved in the coding of the news on biotechnology published by the newspapers.

News items relating to biotechnology were coded and analyzed to see if there are differences in the way mainstream media report this issue for a period of five years before and after the announcement of the national biotechnology policy by the government. To determine the population of news items on biotechnology for the past ten years, the researchers used the database of all news items as compiled by the Malaysian National News Agency or BERNAMA. The population was determined by using the keyword "biotechnology" in addition to the use of other terms, namely, cross breeding, fermentation, stem cuttings, hybrid and conventional breeding to biotechnology. While the themes of modern biotechnology are the biotechnology, cloning, transgenic, genes, genetics, genetically modified food (GMF), genetically modified organisms (GMO), modified organisms (genetically modified), *in vitro*, DNA, stem cells, tissue culture, genetic engineering and genomics.

RESULTS AND DISCUSSION

A total of 729 news items on biotechnology were coded from the four mainstream newspapers. The breakdown of news item according to years is as follows: 29 items or 4% (2001); 90 items or 12.3% (2002); 76 items or 10.4% (2003); 70 items or 9.6% (2004); 207 items or 28.4% (2005); 104 items or 14.3% (2006); 47 items or 6.4% (2007); 45 items or 6.2% (2008); 30 items or 4.1% (2009); and 31 items or 4.3% (2010). The surge in the reporting of biotechnology issues in 2002 and 2003 is due to the controversy relating to the cloning of a baby girl named Eve in 2002. There was uproar in the media with objections coming from people of various walks of life, and in Malaysia, where Islam is the official religion. Such a protest is to be expected because it is contrary to Islamic laws and values. Reporting on biotechnology issues peaked in 2005 when the Malaysian government announced the launching of the national biotechnology policy. In the following years, the number of reports on biotechnology declined. This is to be expected because the currency of the issue was no longer there.

Table 1 shows that over a 10 year period, biotechnology issues were mostly covered by the Malay newspapers with Utusan Malaysia, 366 items (50.2%) and Berita Harian publishing 298 items (40.9%). The New Straits Times, which is an English language daily, publishes 55 items (7.5%) with The Star recording the least amount of news items, a total of 10 articles (1.4%). ANOVA showed significance differences for coverage of biotechnology issues (F = 6387, p < 0.05). Post hoc tests confirmed that Malay newspapers, Utusan Malaysia and Berita Harian were significant (P = 0.01) compared others newspapers. These findings indicate that the Malay-language newspaper Utusan Malaysia and Berita Harian

Table 1. Comparison of biotechnology issues in the four mainstream newspapers.

Newspaper	Frequency	Before	After	Mean	Standard deviation
Utusan Malaysia	366	234	132	442.24	525.35
Berita Harian	298	197	101	317.34	260.22
New Straits Times	55	33	22	459.34	358.38
The Star	8	2	10	155.98	149.82

F = 6.387, significance = 0.001.

Table 2. Comparison of the type of biotechnology issues before and after the launching of the National Biotechnology Policy.

Type of biotechnology	Frequency	Before	After
Conventional	24	12	12
Modern	460	245	705

Chi-square = 2.364, significance = 0.124.

reported the issues of biotechnology more than the English language newspapers, New Straits Times and The Star. Two Malay newspapers are more supportive of policies and efforts made by the government to help improve the field of biotechnology in the country on par with other developed biotechnology countries and it is not as strange because the two Malay newspapers is owned by the government. Therefore, the media agenda is dependent on the agenda being played and created by the government (McCombs, 2004; Eyck and Williment, 2004; Durant et al., 1998; Djankov et al., 2003). In other words, if the government focused on an issue such as biotechnology, the mass media especially the Malay newspapers will also focus on that issue. However, when the government turned to other issues or topics in line with the aspirations and reforms in the country, the media reports were also shifted to other issues or topics they feel are more important than the topic of biotechnology. This phenomenon according to Smeltzer (2008) is because of ownership policy by the government. This condition, according to Smeltzer caused the mainstream media not to play their role and responsibility in reporting the news. Smeltzer research found that mainstream newspapers to only report positive issues of biotechnology but deliberately hide the negative issues from the public.

The type of biotechnology issues in the English newspapers, New Straits Times and The Star shows the least coverage of biotechnology issues compared to the other two Malay newspapers. Organizational policy in the media which is in favor towards the privatization policy resulted in the newspapers, The Star in particular is not so keen to report the news of biotechnology to the public. This is because, the newspaper focuses on a few other topics such as, economics and business topics which are well-liked by newspaper readers. This statement is supported by Chua Yew Kay, the Deputy Editor of The

Star, explaining that, the policy of The Star Group is more focused on the development of society's minds through newspaper reading. However, the issue of biotechnology is not an issue or topic that they feel is important to be reported to the reader.

Table 2 shows that, modern biotechnology aspect highly covered in four mainstreams newspaper compared conventional biotechnology aspect before and after national policy of biotechnology was launched. Further analysis using the chi-square method was carried out to determine whether the association between the aspects of issues in biotechnology is statistically significant. The analysis yielded a chi-square of 2.364 and was not significant at the 0.05 level (P = 0.124). The modern method of biotechnology received greater coverage as compared to the conventional method with each having 705 items (96.7%) and 24 items (3.3%), respectively.

The implementation of the government's biotechnology policy garnered 397 items (54.5%), followed by 92 items (12.6%) on agro-industry and 60 items (8.2%) on research (Table 3). The least covered themes were food and cross breeding with 10 item (1.4%) and 1 items (0.1%), respectively. Analysis using the chi-square method revealed a chi-square value of 31.469 which was significant at the 0.05 level (P = 0.001). It can be concluded then that there is a significant association between the theme of biotechnology issues before and after national policy of biotechnology was launched.

Although there are various types of themes used by scientists, in this study, the researchers found that the level of knowledge about biotechnology is at a moderate level, especially amongst editors and journalists who writes on biotechnology matters (Bauer, 2005). It was found that although there are various themes that researchers have developed, reporters and editors use only a limited number of these themes in reporting biotechnology news, due to their limited knowledge of

Table 3. Comparison of the themes of biotechnology issues before and after the launching of the National Biotechnology Policy.

Theme	Frequency	Before	After
Cross breeding	0	1	1
Genetically modified food	6	8	14
Implementation of biotechnology	272	125	397
Cloning	10	3	13
Technology	20	12	32
Food	6	4	10
Agro industry	54	38	92
Research	39	21	60
Economy	8	11	19
Health	5	13	18
Act	12	11	23
Award	40	10	50

Chi-square = 31.469, significance = 0.001.

Table 4. Comparison of the sources of biotechnology issues before and after the launching of the National Biotechnology Policy.

Source	Frequency	Before	After
Minister	166	78	244
Journalist	17	19	36
Professional	40	21	61
Scientist	36	16	52
Non-organization	5	4	9
Religion people	4	1	5
University	31	12	43
Expert	7	2	9
Non professional	7	3	10
World of organization	3	0	3
Organization	150	97	247
Government	6	4	10

Chi-square = 12.603, significance = 0.320.

biotechnology. The study also found that there were some issues of biotechnology that have been reported using the same themes, but which differ in meaning from the way scientists use them. This point needs to be taken seriously by stakeholders in biotechnology in order to avoid possible confusion that might arise in the process of trying to increase public understanding and awareness of the importance of biotechnology (Latifah et al., 2009; Mus, 2010; Gaskell, 2000; Gaskell and Bauer, 2000; Gaskell et al., 2003).

Table 4 shows that government minister and organization are the most sought source of news stories with 247 items (33.9%) and 244 items (33.5%) respectively. Table 6 shows that source were be used by media to get information about biotechnology. Further analysis using the chi-square method was carried out to determine whether the association between the themes of issues in

biotechnology is statistically significant. The analysis yielded a chi-square of 12.603 and was not significant at the 0.05 level (P = 0.320).

The sources that are widely used for the reporting are the government ministers and directors of corporate organizations which demonstrated almost the same average value. The mainstream media rely on these two sources because the information they provide is believed to be authentic, clear and more trusted by the public. Both these sources also act as intermediaries between the government and the public in reporting issues of biotechnology. The ministers are a source of interest because they have considerable influence in determining the direction of biotechnology in the country with the support of the government, apart from financial assistance that is adequate to implement specific projects or research (Secretariat of the Convention on Biological

Table 5. Comparison of the genre which was regularly used to report on biotechnology issues before and after the launching of the National Biotechnology Policy.

Genre of writing	Frequency	Before	After
News	235	113	348
Features	225	134	359
News features	9	10	19
Opinion	2	0	2
Speech	1	0	1

Chi-square = 6.003, significance = 0.199.

Table 6. Comparison of the tones which was regularly used to report on biotechnology issues before and after the launching of the National Biotechnology Policy.

Tone	Frequency	Before	After
Positive	431	41	472
Negative	249	8	257

Chi-square = 8.245, significance = 0.004.

Diversity, 2000). Similarly, the function of the organizations is as a spokesperson for the government in developing the field of biotechnology and for the dissemination of information to the public.

Most of the stories on biotechnology are published in the form of features with a total of 359 items (49.2%) while news stories amounted to 348 items (47.7%) and there are no significant differences across various newspaper reporting 9 (Table 5). The data showed that there are no significant differences across news and features reporting. Further analysis using the chi-square method was carried out to determine whether the association between the types of writing on biotechnology issues is statistically significant. The analysis yielded a chi-square of 6.003 and was not significant at the 0.05 level (P = 0.199).

This shows that the genre of news and features are reported more than other genres of writing. The genre of news writing is normally expected to be as brief and concise as possible. Owing to this factor, journalists neither do nor explore the issue of biotechnology properly and in details. The constraints faced by journalists in understanding issues related to biotechnology causes the public not to get accurate information about this field. The genre of features is believed to assist in increasing public awareness, and especially consumer knowledge of biotechnology, because it can be described in detail and also includes pictures to facilitate better understanding of the issues involved in biotechnology (Chamil, 2010; Normah et al., 2009).

Data analysis found that tones in this study are more positive, (which is used by journalist to report issue concerning biotechnology) compared with negative tones (Table 6). Analysis using the chi-square method revealed a chi-square value of 8.245 which was significant at the 0.05 level (P = 0.004). It can be concluded then that there is a significant association between the tones of reporting on biotechnology issues before and after national policy of biotechnology was launched.

It can be concluded then, that there is a significant relationship between the tones of reporting on biotechnology issues before and after national policy of biotechnology was launched. This shows that the four main newspapers supported the policies formulated and implemented by the government of Malaysia. As mainstream newspapers, this is not surprising because these newspapers are used by the government to report on important issues, such as those relating to biotechnology to the public. This study found that the tone of writing is positive when that particular writing is about government policies, the success of a research project, or the commercialization of products that promote economic development or improve the standard of living in Malaysia. On the other hand, negative tones are observed with regard to issues that are controversial or that generate conflict amongst members of the public. Examples of such issues are those relating to the production of GMF products that are feared to have potentially long-term adverse effects when consumed. Other issues are those involving human cloning, which are not only against religious teaching, but also encourage immorality within the community.

The mass media in Malaysia is also seen not to have given any room for any form of discussion and debate about biotechnology issues. This situation is certainly different from the Europe and Africa media which

encourage their people to share ideas, opinions and views of these issues (Durant et al., 1998; Bauer, 2005; Kelemu et al., 2003). There are more prominent and independent to express their thoughts towards government regulation especially if it relates to such debate matters such as GMF. In order to overcome this problem, Latifah et al. (2009) also suggested that a dialogue or forum in the mainstream media be made possible, so that balanced information on biotechnology can be reported to the public. Macer (2001) stated that participation and views of people who have no expertise in biotechnology is recommended because it can generate ample debate based on the ideas and information shared among the government, communities and the parties involved in biotechnology. Through this dialogue, the community, especially users of biotechnology will be able to ask questions and obtain adequate explanations to help them to make the right and rationale choices of GM products.

Conclusion

Based on the analysis, the four mainstream newspapers report issue relating to biotechnology differently. The Malay language newspapers Utusan Malaysia in particular and the Berita Harian have more coverage on biotechnology as compared to the New Straits Times and The Star. The higher coverage in the Malay newspapers indicates that these publishers are more supportive of the government initiative to develop further the biotechnology industry in Malaysia. Their commitment to the government initiative is expected because the majority of the shareholders of both these newspaper companies belong to people who are aligned to the ruling coalition. Even though the Malay language dailies support government policies, the way they cover an issue is still dependent on the newsworthiness. In other words, the ruling government may have its own agenda that it wishes to promote but it does not necessarily mean that it will become the media's agenda for an extended period of time. Thus, it is not surprising to note the disappointment of the former Prime Minister, Abdullah Ahmad Badawi on the inability of the government in getting the public to engage in biotechnological issues. Engaging the public in discussing the issue can be done if the Malaysian mass media play an important role. The former premier conceded that the local media in Malaysia seldom or rarely discuss and debate about this issue. Discussion of any issue is a rarity in the Malaysian mainstream media. Most of the items published by these newspapers are in the form of news stories where an issue is reported and not debated on. Feature articles where a particular issue can be delved and debated on are reserved for the op-ed pages only. A well written feature article can not only articulate an issue but it can be used to educate the general public on any substantive subject matter. If the government wishes to educate the public on biotechnology then they will have to find some other alternative methods to do so.

A costly method that can be employed by the government is paying for an advertorial on biotechnology in the local mass media. To be effective, it has to be carried out on an extended period of time.

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