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The Agenda Building Role of Television on Science & Technology Developments: Comparative Study between Private and State-Run TV Channels Coverage

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Abstract

This study is about the agenda building role of television in Pakistan, in the state and private news bulletins, and treatment of Science & Technology news for creating public awareness. The study is of 9am prime time news bulletins of March 2016. Manifest content analysis technique along with a specifically designed code sheet was used in this research. Results show that there was a significant difference between private and state run news bulletins. In the state run PTV news though the news were given prominence, it can be attributed to government projects, future plans, meeting sessions and even public addresses of the political leaders about Science & Technology, making no thoughtful contribution in educating the audience in Science & Technology develoments.

Keyword: *Science, Technology, Media, TV Channels, Public Awareness on Science & Technology, Agenda Building Role.*

Introduction

Science & Technology are continuously changing the appearance of human presence by bringing so many evolutions in today's life and collectively to the whole world. The high-profile researches in this domain are of seldom use unless the common public can apply them for their personal decision making like in case of health issues, nutrition, climate changings and their impacts, alternate energy sources agriculture, applied computer and mobile technology etc. Public awareness about Science &

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Technology supports their effective participation in the nation's socio-economic development. An uninformed community is highly susceptible to distorted concepts e.g. food or medication, which energy source to adopt on micro level and about Science & Technology policy at the macro level. Only informed and well-educated people can understand and contribute towards policy matters (Pellechia, 1997).

For common masses the reality of Science & Technology comes from the salience raised by media on these issues as per the media's agenda. As Nelkin (1987) states that media defines the realism of science for many people. Media plays an imperative role in propagation of information among common public (Peterson, 2009). Whereas, Peterson (2009) also emphasizes about the functioning of media as an interface between the scientist and lay people so as it can perform a dynamic role for communicating about the Science & Technology issues. Because of rising impact of Science & Technology on the public's routine lives in the past few decades, common people have subsequently shown their concerns in the Science & Technology's applied usage in daily lives. (Pellechia, 1997). Media coverage and debates on genetically modified crops, nanotechnology and on many other scientific topics in newspapers, plus electronic media are a proof of this (Peterson 2009). Contrary to this general awareness, Science & Technology literacy and community involvement in Science & Technology related matters either of public usage decisions or policy debates has not been given much attention in Pakistan. The public identifies Science & Technology information mainly in the form of news media content. (Kepplinger et al., 1991; Gaskell et

al., 2001a, 2001b; Nisbet and Lewenstein, 2002 cited in Thomas, 2010).

Naim, in 2001 describes Pakistan has a vibrant scientific community. It, being a nuclear state cannot be considered as an underdeveloped country in terms of its scientific capabilities. He further describes that appropriate use of media can address the lack of coordination between public and scientist. It states that average people of Pakistan are in a sheer need to comprehend various Science & Technology domains by making suitable choices.

Therefore, this research has focused on how Pakistan's electronic media gives public awareness about Science & Technology and contribute towards its enhancement. Pakistan media's role in educating and giving awareness to the public about Science & Technology is explored.

Pakistan is one of the biggest consumption markets for trade of innovative scientific and technological sector stuffs including the pure sciences, earth and life sciences, substitute power sources, weather variations, latest health related medical treatments and national security, which have a deep impact on the socio-economic conditions of the people of Pakistan. In the process of accessing and communicating Science & Technology information to the general public the media holds a distinction. Media is a significant mode to brilliantly promote Science & Technology (Gellnerová, 2015). Since the mushroom growth of TV media in Pakistan after privatization of the electronic media since 2000, the vital importance of the TV as a medium for education and awareness is undeniable. Therefore, the significance of

sharing news of Science & Technology through the TV media is irrefutable.

This research is designed to look into the nature and extent of "coverage" given to Science & Technology in news and current affairs in private and state-run television channels of Pakistan. It also explores the category-wise coverage given to Science & Technology, and treatment of this coverage by Pakistan TV which may affect public awareness regarding Science & Technology for their social and economic development. It also examines that how such news coverage is treated by these TV channels in terms of placement in the news bulletins, time given to Science & Technology news.

Research Questions

RQ 1. How much coverage is given to Science & Technology by the news and current affairs television channels of Pakistan?

RQ2. Which type of Science & Technology news is given more coverage?

RQ 3. How news stories relating to Science & Technology are treated in terms of placement and duration in news bulletins of Pakistan's news TV channels?

RQ 4. Whether and up to what extent the Science & Technology news stories of the compared news and current affairs TV channels are contributing knowledge towards Science & Technology?

RQ 5. Whether there is any difference in extent of coverage and treatment of coverage given to Science & Technology news given by PTV and Geo News channels in their prime-time news bulletins?

Literature Review

The literature review for this research firstly includes the recent academic literature on the importance and contribution of science journalism towards progress of a country. Secondly, it securitizes the prospects and problems faced by the TV coverage of the Science & Technology. The third section emphasizes on the significance of the TV media for the popularization and literacy of the Science & Technology. Afterwards the detailed treatment of the Science & Technology coverage on TV has been reviewed. Then tremendous societal value of the well-done science journalism for Pakistan is reviewed in the scenario of the influential issues on Science & Technology coverage that refers to the contribution of such news towards Science & Technology popularization or vice versa case. Moreover, contemporary issues faced by TV science journalism have been reviewed. At the end, analytical framework for the current research has been devised in the light of discussed literature review.

During the pilot study for this research it was revealed that in Pakistan majority of the scientific research is performed under the government institutions. The research results of Science & Technology may not be fully disseminated to the public via mass media appropriately for the socio-economic benefit. As during interpersonal communication with certain officials from "Pakistan Science Foundation (PSF)" and "Pakistan Scientific and Technological Information Centre (PASTIC)" opined that whether it is matter of invention of wheat seeds for diabetic patients or production of without seed oranges, all such researches remain shelfed and not disseminated via media.

Furthermore, in a developing nation like Pakistan science culture lacks awareness of the public masses because of the fear of difficulty level they may encounter while understanding the Science & Technology related issues. The challenge lies in producing mindfulness plus interesting aptitude in Science & Technology which is the back bone for development of a nation.

Prospects and Problems of Science & Technology Coverage on TV

Studies reviewed in this section reveal as detailed below, that editor and producer's choice for choosing the Science & Technology content focuses merely on the attention grabbing content and style of entertainment. Although the science journalism was later on converted towards systemized, noticeable and progressively influential manifestation. Where TV news mainly focus on the entertainment aspect of science news with an irregular pattern of coverage.

Broks in 2006 has described that though Science & Technology stories appear in the mass media yet their writing has kept on changing with respect to different countries and cultures worldwide. Dunwoody(2014, p.28) while pointing out the selection of stories says "editors did not care that a topic was scientific, only that it was novel and likely to grab the attention of their readers." He further elaborates that because of the expensive and rareness of the specialist reporters, editors alleged intensely about the capability of a worthy "Generalist" who can cover whatsoever is coming on their way.

Gregory and Miller (1998) characterize scientific and technological innovations (that were catalyzed by World War II

and stimulated focus in 1970-1980); based on finding science and environment reporters. He further narrates that during this post war period science journalism converted to a systematized, noticeable and progressively influential manifestation in journalism. Welcome Trust Survey of British people finds that adults were more likely to prefer for Television (29 percent) for Science & Technology news. American data from 2010 showed that, while television has long been the preferred channel for science information, for the first time the internet was running neck and neck with television (National Science Board, 2012). Pakistan being a country under a great influence of UK and America, iconize the trends prevailing in these countries as development indicators and thus tend to adopt the same.

Einsiedel (1992) met a supremacy of health and fitness issues during an examination of science news stories in seven Canadian newspapers. Television was found to be a more chosen medium amongst the mostly chosen countries, along with a repeated robust emphasis on "natural history" and "environmental issues". Again, in this study, "medicine and health" were frequently dominated. (Gregory and Miller 1998; León 2008; Lehmkuhl et al. 2012). Science news on television in Europe find not much of it (de Cheveigné 2006; León 2008). Television news typically focus irregularly to science topics, and broadcast stories that emphasize the entertainment aspects of scientific discoveries and processes at the cost of detailed, explanatory and serious handling (León 2008; Metcalfe and Gascoigne 1995). An investigation of science in BBC news programming presented a slightly more encouraging picture of

the situation in the UK. Analysis of news coverage over the course of three months in both 2009 and 2010 found that one in four news programs included at least one science news item, as well as half of the main television news bulletins contained science news reporting (Mellor et al. 2011).

Contemporary Issues of Science & Technology Journalism in Pakistan

While reviewing the literature regarding Science & Technology coverage on electronic media it was revealed that though a great share of research has been steered, yet very diminutive research has been done in Pakistan. Moreover, it was also revealed that there is a sheer deficiency of information availability regarding the overall state of Science & Technology reporting in Pakistan's main stream media explicitly. Some earlier researches had inclined to focus either on newspapers or on a single specific matter in the scientific domain. Yet it was seldom tried to be investigated about the electronic media TV channels' coverage on Science & Technology.

Theoretical Framework

The theoretical framework for the study is Agenda Setting Theory. Agenda Setting Theory focuses on the creation of the masses awareness along with raising the importance of issues. The filtration and shaping of the reality by the media help to understand the set agenda of a media organization. This research further explores in detail what extent of Science & Technology coverage is reinforced and maintained in Science & Technology coverage by the Pakistani TV channels by drawing a comparative analysis between them.

Methodology

The methodology for this research is content analysis which defines subject matter's features by elaborating the message content attributes. It has helped powerfully to draw interpretations about the content producers. (Internews, 2012) reports, "Television has become the main source of news and information for people in Pakistan's towns, cities and large areas of the countryside." The researcher has chosen to cover the 9:00 pm prime time bulletin of news TV of 30 days for two news channels March 2016. One private news channel named as "Geo News" and the other one a public news channel as "PTV news".

Population and Sampling Technique

The sample of news bulletins was selected from PTV news and Geo News. PTV being the only state-run TV channel in the Pakistan while Geo is the number one rated news channels amongst private TV channels (Gallop, 2015) which enjoys the biggest viewer ship in the prime-time TV news i.e. 9:00 – 10:00 Pm. (Salman Danish , 2015; Infoasaid, 2012; Gallop, 2015 & Daily Pakistan Global, 2016). The sampling technique was used as a purposive sampling which is a kind of non-probability sampling technique also known as selective, judgmental or subjective sampling. Here the units investigated were based on the decision of the investigator, tied strongly with the objectives of the research. The unit of analysis is the Science & Technology relevant news content in the form of news stories/special packages/interviews in the 9:00 pm bulletin of the selected TV channels.

Process Involved

Science & Technology news stories broadcasted in the 9:00 PM prime time news bulletin of aforementioned both channels are selected, from the pre-recorded archives of 9:00 PM news bulletin of GEO News and PTV News. They were coded for consecutive days for one month.

The whole bulletin of both news TV channels was viewed and new stories relating to Science & Technology issue were coded as per the coding sheet. Time duration of the Science & Technology news items were specifically recorded with the help of a stop watch.

Macnamara.J, (2004, p.09) show as cited in (Neuendorf, 2002, p.11) also, that the research design involving content analysis requires a deductive scientific approach as "all decisions on variables, their measurement, and coding rules must be made before the observation begins". Same method of coding was designed for this research as well. There are rules defined for coding regarding operationalization of each news category. The researchers created a sequence of rules as mentioned in the above coding regarding each operational category, about which the coder had to answer yes (1) or no (0). For Science & Technology news related variables as detailed above. Analysis of data also includes presence or absence of certain indicators.

For news story identification number, running number, a number on ascending order to each news story that is coded are uniquely assigned. The relevant date of broadcast was recorded in the pattern of Month/Day/Year. An identity number was allotted to the selected channels, 1 for state run PTV news and 2 for private Geo news TV channel.

The collected data through primary sources (news items) was analyzed through content analysis as detailed in methodology section via coding sheet. (Quantitative analysis via SPSS).

After applying statistical tests on the collected data in SPSS e.g. cross tabulations and MS Excel appropriate and well-suited tests were conducted to get interpretations. Measured variables as per the coding sheet were separately analyzed and then their mutual relationships were analyzed in the light of the data findings and interpretations were inferred from the figures and tables.

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News Story: A news story as a unit of coding is a news item under the relevant category or relating to relevant category and found in the 9:00 pm bulletin of the selected news TV channel.

Story Identification Number: Running number, a number on ascending order to each news story that is coded are uniquely assigned. Date: The relevant date of broadcast was recorded in the pattern of Month/Day/Year. Channel Id: It is the identity number allotted to the selected channels, 1 for state run PTV news and 2 for private Geo news TV channel.

After applying statistical tests on the collected data in SPSS e.g. cross tabulations and MS Excel appropriate and well-suited tests are conducted to get interpretations. Measured variables as per the coding sheet were separately analyzed and

then their mutual relationships were analyzed in the light of the data findings and interpretations were inferred from the figures and tables.

Data Analysis and Discussion

Extent of Coverage of Science & Technology News

RQ.1. How much coverage is given to Science & Technology by the news and current affairs television channels of Pakistan?

The results of the coverage given to the Science & Technology by the news and current affairs television channels of Pakistan are below as shown in Table-1(a). Out of 31 days Science & Technology news were present on all the 31 days on PTV news that counts for a total of 282 total news with 0 absence. Whereas out of 31 days Science & Technology news were present on 26 days on Geo news that counts for 43 total news with 5 absence days. Table-1(a).

Table-1 (a) News Frequency

Channel	Number of Days	Number of News	News Presence Days	News Absence Days
PTV	31	282	31	0
GEO	31	43	26	5

While discussing the coverage extent PTV news was found to be covering the Science & Technology news on daily basis on serious grounds, though Science & Technology related events emerged as the main dominant coverage category. In this category the main focus of the PTV news was found to be projecting government projects, future plans, meeting sessions and even public addresses of the political leaders about Science &

Technology related issues. With such sort of coverage although there is not appropriate contribution to the Science & Technology knowledge domain yet an awareness in terms of the existing superficial grounds is provided, that is not making a thoughtful contribution to the Science & Technology knowledge. In case of the privately-run Geo news on consecutive five days there was an absence of the Science & Technology news, that show the absence of the agenda for Science & Technology news on vital basis.

Geographical Extent of Science & Technology News Coverage

Regarding geography of Science & Technology news on PTV News and Geo News findings points out results as given in Table-1 (b) below.

Table-1(b) Geography of Science & Technology News

Channel	International News	National News
PTV	10%	90%
GEO	31%	69%

While exploring the geography of the Science &Technology news, PTV news enjoys the proximity factor for the news coverage and gives a big dominance of 90% to national Science & Technology news, and Geo News though dominantly covers 69% of national but includes a much bigger percentage of 31% of international news as well. This show that the presence of certain relations between Science & Technology coverage treatment.

Dominant News Category amongst Science & Technology News

RQ2. Which type of Science & Technology news is given more coverage?

Regarding Science & Technology news categories being covered on both PTV news and Geo News the findings are as follows given in Table 2(a).

The dominant coverage category at PTV news was Science & Technology related events whereas this was found to be the least covered category on the Geo news. The salience of the Science & Technology news category for both states run, and private channels is significantly different with ratios of 27.7% at PTV news vs 6.3% for the same Science & Technology related events at Geo news shown in Table 2(a). The reason for this big difference appears to be the presence of mere focus on state affairs coverage in Science & Technology domain at PTV which is not supported by the agenda of the Geo news. This also supports the theoretical framework of Agenda Setting Theory chosen for this research as it portrays that media tend not to represent reality rather, they filter and shape the reality. Same was the case found in case of Science & Technology news coverage.

Earth Sciences category emerged as the highest Science & Technology news category with 43.8 % coverage on Geo news followed by the Technology category with 14.6% coverage. Moreover, it is worth mentioning that Science & Technology related Events with 6.3% coverage emerged as the least covered category shown in Table 2(a). Nil category with 10.4% refers to the days when no category of Science & Technology news was covered in the prime-time bulletin of Geo news.

Table 2(a): Dominant Coverage Category

Science & TechnologyNews Category	PTV News Percentages	Geo News Frequencies	Geo News Frequencies	Geo News Percentages
Earth Sciences	70	24.8	21	43.8
Health	41	14.5	6	12.5
Nil	20	7.1	5	10.4
Pure Sciences	33	11.7	6	12.5
Science & Technology Related Events	78	27.7	3	6.3
Technology	40	14.2	7	14.6
Total	282	100.0	48	100.0

Treatment of Science & Technology News

RQ.3: How news stories relating to Science & Technology are treated in terms of placement and duration in news bulletins of Pakistan's news TV channels?

Placement

Table-3(a) illustrates that the main prominence i.e. 41% of Science & Technology news is found in the 3rd quarter at PTV news. It shows that the main prominence i.e. 44% of Science & Technology news is found in the 3rd quarter at Geo news.

Table-3(a) Science & Technology News Placement

Channel	News Bulletin Placement Quarter	Prominence Percentage of Science & Technology
PTV	Third	41%
GEO	Third	44%

Duration

Table-3(b) show a coverage of a total of 302 minutes in the whole month out of the total of 1860 minutes of prime-time bulletin on 31 days of the month of March. (31 days * 60 minutes for each day = 1860 minutes). Whereas it also show a coverage of a total of 47 minutes in the whole month, out of the total of 1860 minutes of prime-time bulletin on 31 days for Geo news.

Table-3(b) Science & Technology News Duration

Channel	Prime Time (in minutes)	Science & Technology Coverage (in minutes)
PTV	1860	302
GEO	1860	47

Table-3 (c) show the time duration percentage of total 16.23% of the coverage of Science & Technology news in the whole month out of the total time duration of 83.77% of prime-time bulletin on 31 days on PTV news. Whereas it also show the time duration percentage of total 2.53% for the coverage of Science & Technology news in the whole month out of the total time duration of 97.47% of prime-time bulletin in 31 days on GEO news. The regular duration found for prime-time news bulletin on both PTV news and Geo news is of one hour i.e.9:00 pm – 10:00 pm.

Table-3(c) Science & Technology News Coverage Duration

Channel	Duration Percentage	Total Prime Time in 31 days
PTV	16.23%	83.77%
GEO	2.53%	97.47%

Prominence

Third treatment given to Science & Technology news explored was their placement in the bulleting that shows the prominence allotted to the Science & Technology news in the prime-time bulletin as shown in Table 3 (c). For this purpose, the placement and the duration indicate that, an aggregate percentage of 69% of Science & Technology news found collectively in 2nd and 3rd quarter of the bulletin is the most appropriate placement slot. Geo news has also placed an aggregate of 57% Science & Technology news collectively in 2nd and 3rd quarters of the 9:00 pm bulletin. Moreover, the total time duration i.e. 16.23% given to Science & Technology news for 31 days is also greater than the total time duration given to them at the Geo news i.e. 2.53%. This show the agenda of prominence in terms of placement as well as the duration given to the Science & Technology news serves them more appropriately at the state-run TV channel i.e. PTV news than the private TV channel i.e. Geo news.

Knowledge Contribution towards Science & Technology

RQ4. Whether and up to what extent the Science & Technology news stories of the compared news and current affairs TV channels are contributing knowledge towards Science & Technology?

Table-4 show that a total of 28% Science & Technology news stories on PTV news are contributing knowledge towards Science

& Technology, while 51% are contributing something towards Science & Technology knowledge domain and 50% are non-knowledge contributing and doing Govt. projection. Moreover, (Table -4) show that a total of 4% Science & Technology news stories on Geo news are contributing knowledge towards Science & Technology, while 12% are contributing something towards Science & Technology knowledge domain and 4% are non-knowledge contributing in projecting the state affairs.

Table -4: Science & TechnologyNews Knowledge Contribution

Channel	Science & Technology Knowledge Contributing	Science & Technology Semi Knowledge Contributing	Science & Technology Non-Knowledge Contributing (State Projection)	Total Number of Stories on 30 days
PTV				282
Percentages	28	51	50	
Number of Stories	79	145	141	
Geo				48
Percentages	4	12	4	
Number of Stories	10	33	12	

Collective Extent of coverage and treatment of coverage given to Sci-Tech

RQ5. Whether there is any difference in extent of coverage and treatment of coverage given to Science & Technology news by PTV and Geo News channels in their prime-time news bulletins?

Table-5(a) shows the comparative coverage by the PTV news and Geo news in the categories of Science & Technology news. It depicts an overall percentage of 85.5% Science & Technology news on PTV news and 14.5% found on Geo news. It shows a clear dominance of PTV news with a big coverage share

regarding Science & Technology news on TV. It show the state of inclination for the coverage of Science & Technology news on TV channels as well, that can ultimately contribute significantly in the public awareness of the Science & Technology.

Table -5(a): Extent of collective Coverage by TV on Science & Technology

News Channels	Percentage Coverage
PTV News	85.5%
GEO News	14.5%

Table -5 (b) show the treatment of news category wise. It shows coverage of news as 27.6% for Earth sciences news, 14.2% for Health, 6.1% for Life Sciences, 1.5 % for no news about Science & Technology, 11.8% for Pure Sciences, 24.5% for S&T related events, and 14.2% for technology related news collectively by PTV News & GEO News.

Table -5(b): Collective Percentage Coverage Category Wise

News coverage Category wise	Collective Percentage Coverage Category Wise by PTV and GEO
Earth sciences	14.2%
Health	6.1%
Life Sciences	24.5%
No News	1.5%
Pure Sciences	11.8%
S&T related events	24.5%
Technology	14.2%

While analyzing about the collective contribution by both selected channels only 22.7% news were found to be contributing knowledge towards Science & Technology, 59.7% semi-

contributing and a big portion of 47.6% regarding state projection. As shown in Table- 5(c).

Table-5(c): Collective contribution of selected TV channels towards Knowledge of Science & Technology

News Channel	Contribution Knowledge	Semi Contributing	Contributing towards state projection
Both PTV News and GEO News	22.7%	59.7%	47.6%

The findings further indicate that actual contribution in this regard is 28% on PTV news as compared to 4% by the Geo news as shown in Table-5 (d). This infers a big difference in the role played by the state run PTV news and the private Geo news. It mandates the attention of the state policy makers and agenda setters of the private and state TV channels to consider this avenue on well- structured grounds. As Science & Technology's role in the country's development for the socio-economic progress of the nation is undeniable. This shows the seriousness of the private and state-run TV news and current affairs channels towards Science & Technology.

Table-5(d): Contribution towards Science & Technology knowledge by selected news channels

News Channel	Science & Technology Knowledge contribution		Science & Technology Semi-Knowledge contribution		Science & Technology non-Knowledge contribution (State Projection)	
Channels	Percentage	No of Stories	Percentage	No of Stories	Percentage	No of Stories
PTV News	28%	79	51%	145	50%	141
GEO News	4%	10	12%	33	4%	12

Science & Technology News Coverage: Joint Perspective of Pakistan's News TV Channels

Table-5 (e) depicts the collective percentages by both news channels in terms of proximity. It became evident that due to the proximity factor 85% news in national category vs. 12.7% international S&T news are covered collectively by both PTV and Geo news channels.

Table-5(e): Collective percentages by both TV Channels, PTV news and GEO News

News Channel	Proximity	Percentages
Both PTV news and GEO News	National	85%
	International	12.7%

Conclusion

Community understanding about Science & Technology is significant and important for the regular practice of Science & Technology and relative decision making in the routine lives of

the members of society. This understanding is ranging from the choice of an IT gadget to get awareness about the environmental changes to the state policies and day to day affairs that ultimately affect the development of a country. Potential hindrances in terms of overall category wise coverage, and the treatment of this coverage by the Pakistan's news TV channels are identified through this research that may affect the public awareness regarding Science & Technology for their economic and social development.

The potential objectives of this study was met by identifying the agenda building role of Pakistan television on scientific & technology development. Pivot areas for agenda re-buildings and revising according to the results obtained by this research indicate the potential avenue of Science & Technology knowledge contribution levels by both news TV channels. The identified hindrances relating to the coverage of S & T which may affect public literacy regarding Science & Technology in the country, are found in the treatment given to the Science & Technology news story in terms of manifesting variables of prominence, duration and proximity.

This research validates certain novel constructs both empirically and statistically, collects certain qualitative information which arguably provide a deeper and clearer understanding of the competing as well as lacking abilities of the private and public news TV channels of Pakistan. This potentially helps to disseminate the knowledge about Science & Technology and can facilitate the knowledge towards Science & Technology literacy in Pakistan. The research reveals that the percentage of

Science & Technology news coverage is significantly lower in Private TV news channels than in state run TV channels. The probable reason may be the inclusion of the government projection relevant to the Science & Technology news on state run TV i.e. PTV news and exclusion to a very less number by Private news TV i.e. Geo news.

Moreover, this study is a contribution to improve the standards of Science & Technology information dissemination by TV news channels in Pakistan. In the current era of mushroom growth of television channels it is recommended to just not increase the coverage on Science & Technology but also make it more understandable to the audience.

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