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EDITORIAL

The Social Science Research: Application of Practice

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This regular issue of the Macro Management & Public Policies collects six articles.

The paper, titled Quality of Papers Stems from Authors and Quality of Teaching Stems from Professors, constructed the “SPQR Principle” (Semper Paratus ad Qualitatem et Rationem) to analyse papers, books and teaching. After researching cases from PRT Journals and teaching documents, the author found that the quality of papers is obviously related to the quality of journals. High quality papers are published only in “Peer Reviewed Trusted Journals (PRTJ)”, while low quality papers are published in the “Predatory Publishing Journals”. But it is not correct. This paper shows that the quality of papers depends on the quality of the authors and we should pay more attention to the two sides of the “publishing medal”: authors and professors.

The paper, titled Determination of Business Strategies Using SWOT Analysis; Planning and Managing the Organizational Resources to Enhance Growth and Profitability, tried to provide some basic research for the SWOT and several practical insights of steps to provide a matrix. SWOT has a long historical background, and the results can be expressed by a matrix which contains four factors: strengths and weaknesses, opportunities and threats faced by the company. The analysis combines the internal and external of the organization, its own strengths and weaknesses, environmental threats and opportunities, which can effectively help enterprises achieve the current goals. Although this method has some shortcomings, it can help enterprises to formulate future strategies.

In the paper, titled Population Change vs Natural Geography in Asia: A Sociological Appraisal, intended to investigate the environmental and social problems caused by population change. In Asian countries, population change is a more positive phenomenon. And in this area,
the mismatch between population growth and external carrying capacity has brought many problems. With the advancement of urbanization and the influx of a large number of people, the new lands are overpopulated while the old are underpopulated. Moreover, the population explosion in a short period of time has also brought about environmental and pollution related problems. This kind of change has brought complex consequences, which is worthy of scholars’ research.

The paper, titled *Human Rights and Social Justice through Open Educational Resources and Lifelong Learning*, examined how the promise of resilient, sustainable quality open education. In the context of sustainable development and education for all, OER (Open Education Resources) was adopted in 2019. It includes five aspects: building capacity and using OER; formulating supportive policies; ensuring effectiveness; promoting the establishment of sustainable OER model; promoting international cooperation; monitoring and evaluation. In today’s society and the global epidemic of COVID-19 in 2020, OER involves human rights and social justice, and the proposal will become a catalyst for the realization of several other sustainable development goals, so it is vital.

The paper, titled *A Comparative Study of Humanistic Exchange and Cooperation between China and Southeast Asian in the Perspective of “the Belt and Road” Initiative*, describes and discusses the China-ASEAN strategic partnership. Nowadays, the communication between countries in the world is no longer just economic exchanges, and the interaction between cultures has become the mainstream. After studying the cases of Confucius Institute, sister cities and tourism cooperation, the paper found that the cultural exchanges between China and Southeast Asia had a long history. Under the Belt and Road, China and Southeast Asian countries are more closely connected through the ancient maritime Silk Road. This has further consolidated the strategic partnership between China and ASEAN, and also provided a reference for building a community of shared future for mankind.

The paper, titled *A View of Beijing’s Traffic Policy: Evaluation on the Policies Released in 2010 to Ease Traffic Congestion*, the author paid attention to the traffic policy and Beijing traffic. Because of the developing economy and the process of urbanization, many cities in China face the problem of traffic, especially Beijing. The author takes it as an example, researched the number of cars during the end of 2005 to the end of November 2010. He found that motor vehicles in Beijing increased from about 2.58 million to about 4.69 million. The problem of traffic affects the daily lives of the residents.
ARTICLE

Quality of Papers Stems from Authors and Quality of Teaching Stems from Professors

Fausto Galetto*

Industrial Quality Management, Politecnico di Torino, Turin, Italy

ABSTRACT

On the web it is very frequently found that good papers are published only in “Peer Reviewed Trusted Journals (PRTJ)”, while low quality papers are published in the “Predatory Publishing Journals”. Here we show that this is not true, because the quality of papers depends on the quality of the authors in the same manner that quality of teaching depends on the quality of professors. Since generally the authors are professors it is important to see the two sides of the “publishing medal”: authors and professors. We will use the SPQR Principle [«Semper Paratus ad Qualitatem et Rationem (Always Ready for Quality and Rationality)»] as the way to analyse papers, books and teaching; it seems that very few people have taken care of Quality of Methods (Deming, Juran, Gell-Mann, Shewhart, Einstein, Galilei). The cases analysed here are from PRT Journals and teaching documents.

Keywords:
- SPQR
- Quality of methods
- Design of experiments
- Quality education
- Peer review
- Open access
- Non-open access
- Methods for quality
- Rational manager
- Quality tetralogy
- Intellectual honesty

1. Introduction

There are many Open Access Journals which publish papers and ask a fee for that [named APC (Article Processing Charge) or a similar acronym]. They are classified, in Wikipedia, as “Predatory publishing”.

There are several scholars thinking that a proof of documents Quality depends on their citations; this author saw that the BAD attitude is well diffused: those researchers do not consider that citations depend many times on the readers that are unable to evaluate the scientificity of the ideas given in the papers [30-116] because they do not analyse the data Scientifically and are unable to decide if the methods provided are Scientific or not.

Unfortunately, Universities generate a great need of publishing papers, because they ask for publications to become professors. This author had the opportunity to analyse many of those papers and many times when he asked to the applicants (for professorship) “Why did you write such a statement…” he received the reply either “My
colleague wrote that,”” or “I found it in Wikipedia” or “I read it in that book…”: in spite of their incompetence, they were promoted to become professors!

See this from A. Einstein thinking: «An Academic career poses a person in an embarrassing position, asking him to produce a great number of scientific publications…».

This is a concept shared by this author [99], because he saw many researchers doing that, without taking care of Quality of papers. [83-101] The author met several professors who wrote wrong papers and were teaching wrong ideas to their students, using wrong books. [10-24]

There is a vast criticism about Open Access Journals (OAJ) on the web: since they ask fees for publishing papers OAJ are considered as “means for tricking people”; see for example, for SPG, in [11, 21] “Science Publishing Group is not read by scientists…”

Actually, author’s opinion (based on his long experience) is that the quality of papers is not related to the fee, asked by the OAP; on the contrary, it depends mainly on the authors low quality and on the Peer Reviewers; it is the same for “trusted magazines and journals” [83-127].

To avoid that, this author invented the SPQR Principle [“Semper Paratus ad Qualitatem et Rationem” (“Always Ready for Quality and Rationality”)] as the way to analyse both books and papers [112], only that very few people have been considering carefully Quality of the Methods: e. g., Deming, Juran, Gell-Mann, Shewhart [3-8]. The author never met somebody else who did that... As a consequence, professors, researcher, managers, scholars and students have been learning wrong ideas, in the Quality field: there is worldwide used book with many wrong concepts [e.g., D. C. Montgomery falls in contradiction! He spreads wrong concept on Quality [9, 10]]. Is an OAP the publisher Wiley & Sons? Obviously not! See the Formula 1 Race in Bahrain (December 6 2020): Bottas 4 pt., Russell 3 pt., Vettel 0 pt., Leclerc 0 pt.: Mercedes had lower “quality” than Ferrari!!! A similar case happened in Abu Dhabi: Bottas 18 pt., Hamilton 15 pt., Vettel 0 pt., Leclerc 0 pt.: Mercedes had again lower “quality” than Ferrari!!!

In this paper we shall use various ideas that the readers can find in the paper [99]. It is a paper from an Open Access Journal; is it not read? We do not know. If really it is not read it is important to repeat some ideas you can find there.

We will cite several times the QEG of a University; quite a few professors in QEG still suggest the Montgomery books to students; bad idea: see the case analysed in [32] which has various problems [11, 12]. In the web (www.qualityengineering.polito.it) you can find the hyped ideas of QEG about “their Quality”. Fantastic... See Ref. The last paper you can find there is [128] (M. Galetto et al.). Surely, that journal is not OAP! The paper shows some methods for the analysis of experimental and optimisation of a process for Selective Laser Melting. There one find the Design of Experiment (DoE) and analysis about which the authors consider very “effective...” [128].

Here are the data.

<table>
<thead>
<tr>
<th>Table 1. [full design 3^3; measured Hardness is the response]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control factors</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>P (W)</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>340</td>
</tr>
</tbody>
</table>

**Excerpt 1.** (from [128])

Any intelligent student can easily find that the optimum is already in Table 1, without any use of Minitab!

We will see later other findings of QEG.

QEG team thinks that citations are very important for measuring quality of papers.... Actually there are various ideas about Bibliometrics in the paper [97]. The interested reader can see there.

In the paper [112] we analysed a case taken from a QEG book [32] (published by Springer-Verlag which apparently is not an OAP!!); it is an application of DOE, as the one in Table 1 (where there are the data...). There [32] we did not have the data; that was a situation where several times a reader can find himself: the authors of the documents provide their conclusions and the reader has not any possibility of verifying them: “Take it or leave it”! It is the same in [33], another NOAP!
Other wrong documents are \cite{9, 10, 11, 29, 30, 31}: they are not published by OAP, asking the fee. There any intelligent reader can see that, for OAP documents, the Quality depends on the authors... and on the “Peer Reviewers”; you can find many ideas in the papers \cite{111, 112}. See also Figure 2.

Readers do apply SPQR, in order not to be cheated; if you use your own intelligence and that Principle you understand clearly the issue (remember the Quality Tetralogy: every Scholar must remember Figure 1).

The present paper (as many others of this author, in References) is written for Managers, for Students (who will become Managers), for Young Researchers (who will become Scientific Researchers), for Scholars (who want to learn good ideas Scientifically), and to Professors.

Figure 1. Statements from Deming, Gell-Mann, Galetto ideas.

As appreciated by J. Juran who, at the 1989 EOQC Conference in Vienna, highlighted the content of the paper \cite{50} about the importance of the Quality of the methods for making quality: the paper shows the only good methods are crucial for suitable decision taking.

Since the data are unfortunately always variable we must take into account all the uncertainties, because they have consequences on our decisions: we face “decision-making under uncertainty”.

In many cases, a reader is confronted with the fact that he does not have the data; therefore he cannot analyse the authors’ conclusions; this is a very bad situation.

Other times it is very easy to find the errors; see the following wrong attached statement taken from a course on Quality Management, where OEG members suggest Montgomery books to students:\cite{!!!} Any good student knows that the previous formula holds for any distribution and any sample size n: the Central Limit Theorem does not have any importance for that, BUT QEG professors do not know that!!!!!!! Remember: that formula holds for any distribution and any sample size n.

Figure 2. The SPQR Principle.

Several F. Galetto documents \cite{from 37 to 112} proved and are proving that the negative considerations on the OAP are valid also for other publishers: see the references and Academia.edu and Research Gate.

Remember J. Juran \cite{50} for Decision-Making.

2. A first Case of a Non-OAP Paper

We consider here the content of a paper, published by NOAP, that has the same problems of the OAP: the cause
is the authors’ and Referees’ incompetence. It is the first of two papers both related to the QEG Turin Politecnico...

F. Galetto did not have any success in inviting them to act scientifically, many times, in their work!

The members of QEG think that papers published in Trusted Journals are good, by definition: several times that is untrue.

We consider first the paper \([128]\). The author uses in the paper the data (nc stands for number of non-conformity, while \(p\) is the proportion) from the Montgomery book, the book suggested [as done by the QEG] to his students; \(TQM\) is a NOAP, obviously.

\([126]\) is another paper of him…

| Table 2. taken from \([128]\) |

<table>
<thead>
<tr>
<th>Sample</th>
<th>(t_1)</th>
<th>(t_2)</th>
<th>(p_1)</th>
<th>(p_2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.12</td>
<td></td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0.15</td>
<td></td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.20</td>
<td></td>
<td>0.03</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.25</td>
<td></td>
<td>0.04</td>
<td></td>
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<tr>
<td>5</td>
<td>0.30</td>
<td></td>
<td>0.05</td>
<td></td>
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<tr>
<td>6</td>
<td>0.35</td>
<td></td>
<td>0.06</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.40</td>
<td></td>
<td>0.07</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>0.45</td>
<td></td>
<td>0.08</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>0.50</td>
<td></td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>0.55</td>
<td></td>
<td>0.10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>0.60</td>
<td></td>
<td>0.11</td>
<td></td>
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<tr>
<td>12</td>
<td>0.65</td>
<td></td>
<td>0.12</td>
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<td>13</td>
<td>0.70</td>
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<td>0.75</td>
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<td>0.14</td>
<td></td>
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<tr>
<td>15</td>
<td>0.80</td>
<td></td>
<td>0.15</td>
<td></td>
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<tr>
<td>16</td>
<td>0.85</td>
<td></td>
<td>0.16</td>
<td></td>
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<tr>
<td>17</td>
<td>0.90</td>
<td></td>
<td>0.17</td>
<td></td>
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<tr>
<td>18</td>
<td>0.95</td>
<td></td>
<td>0.18</td>
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<tr>
<td>19</td>
<td>1.00</td>
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<td>0.19</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>1.05</td>
<td></td>
<td>0.20</td>
<td></td>
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<tr>
<td>21</td>
<td>1.10</td>
<td></td>
<td>0.21</td>
<td></td>
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<td>22</td>
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<td>24</td>
<td>1.25</td>
<td></td>
<td>0.24</td>
<td></td>
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<tr>
<td>25</td>
<td>1.30</td>
<td></td>
<td>0.25</td>
<td></td>
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<tr>
<td>26</td>
<td>1.35</td>
<td></td>
<td>0.26</td>
<td></td>
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<tr>
<td>27</td>
<td>1.40</td>
<td></td>
<td>0.27</td>
<td></td>
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<tr>
<td>28</td>
<td>1.45</td>
<td></td>
<td>0.28</td>
<td></td>
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<tr>
<td>29</td>
<td>1.50</td>
<td></td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>1.55</td>
<td></td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>

The following Figure 3, taken from Montgomery book, shows the Control Chart, when all the samples are considered.

The author puts \(x=1/t\) and computes the means \(\bar{t}_1\) and \(\bar{t}_2\) of the time lengths related to the 1st 30 samples and the 2nd 24 samples; he then interpolates the proportion \(p\) of the nonconformities \(\bar{p}_1\) (mean of the 1st 30 samples) and \(\bar{p}_2\) (mean of the 2nd 24 samples) both concentrated, respectively, at \(\bar{t}_1\) and \(\bar{t}_2\)!!!! There are only two values for the nonconformity proportion \(p\) with only two time means: from these two points one can easily find the estimates of “\(a\)” and “\(c\)”.

The interpolation is made with a curve having equation \(y=c+ax\); \(a\) and \(c\) are estimated by

\[\hat{a} = \frac{\bar{p}_1 - \bar{p}_2}{\frac{1}{\bar{t}_1} - \frac{1}{\bar{t}_2}} \quad \text{and} \quad \hat{c} = \bar{p}_1 - \hat{a} \cdot \bar{t}_1\]

with variance

\[\sigma_a^2 = \left[\frac{1}{\bar{t}_1} - \frac{1}{\bar{t}_2}\right]^2 (\sigma_{p1}^2 + \sigma_{p2}^2)\]

and

\[\sigma_c^2 = \left[\frac{1}{\bar{t}_2} - \frac{1}{\bar{t}_1}\right]^2 \sigma_{p1}^2 + \left[\frac{1}{\bar{t}_1} - \frac{1}{\bar{t}_2}\right]^2 \sigma_{p2}^2\]

The QEG author did not compute the CI! Since, actually, the value 0 belongs to both the CI; therefore, anybody, with the two previous, derives that the parameters significantly different from 0!!!

The QEG author did not realise that the asymptotic defectiveness derived from these formula is nonsense: Look at the Figure 4, with 40 more samples, taken from the Montgomery book: it shows the nonsense!!!

Do you see how much wrong was the QEG professor? The referee of the paper did not find the error, as well, because he did not used the SPQR!

Remember Juran at Vienna EOQC Conference!

Since \(TQM\) is a trusted journal is evident that Quality of papers stems from the authors and does not stem from the publishers.

Therefore it is not true that only “Predatory publishing…” (from Wikipedia), provide their readers with poor quality papers!!!
3. A second Case of a Non OAP Paper

QEG members have been very active on Process Control; they invented in 1998 the “Qualitometro I method” and in 1999-2000 the “Qualitometro II” and in 2005 QEG members invented the “Qualitometro III method” in the papers related to [129].

We cannot give here all the ideas of the QEG members; the interested readers can see various author’s papers [73-79, 86-95, 87, 99-101].

We consider very interesting to draw the readers’ attention on the fact that some Turin Politecnico students, L. Perri (2002), E. Mori (2006) and J. Baucino (2008) found the drawbacks of fuzzy sets in control charts. Using the Scientific Approach they could find that the wrong “control Charts” provide at least 20% out of control events for random data “uniformly distributed” on the scale points: such data “uniformly distributed” must be ”in control” by definition!!! [73-79, 86-95, 87, 99-101].

Clearly, fuzzy sets in control charts are wrong in the way they are used in applications to Quality. [see References]

It is important to mention that those wrong ideas were copied [see Figure 1] from [130].

Those trusted journals are surely NOAP.

Nevertheless they put out wrong papers.

It is natural that those (authors) professors teach wrong ideas to their students. [126]

The findings of F. Galetto are opposite to what it can be found in the web about OAJ as “means for tricking people” (asking fees for publishing papers).

It is very clear that the bad quality happens for ”well reputed and trusted magazines and journals”, as well. See [from 85 to 95, 126].

4. A third case of a NOAP paper

In the introduction we mentioned a DoE about which the QEG authors (M. Galetto, et al.) hyped their “effective” methods; it is found in the paper [127]. Surely, that journal is not OAP! The data are in Table 1: it is a full design 3³ (3 factors at 3 levels each); the response is the Hardness. The QEG authors, using Minitab 17, make all the computations and find the optimum setting in the Excerpt 1.

Their optimum response is Hardness=122.45 HB; the authors compute the 95% Confidence Interval of the optimum: CI=118.08−−−−−−−−−−−126.83; if one looks at Table 1, without any use of Minitab, he can see the maximum 121.0, at run 6.

Figure 5. Analysis of the data of Table 1 (Control Chart)

The “Control Chart” (assuming that the data were Normally Distributed, as done by the paper authors) shows pictorially the runs (that you see in the previous table) were the response is near the optimum.

If the problem were to find the optimum, anybody could find it only by looking at the maximum of Hardness, because the Design is a Full Factorial.

On the contrary, the authors were forced to assume that the data were Normally Distributed, before making any calculation.

From Figure 6, we see clearly that the Distribution is not Normal.

Figure 6. Distribution of Hardness (data in table 1): it is not Normal

Therefore, one cannot apply the Least Square Method
(either of ANOVA, or of RSM).

In spite of that, the paper authors found the function

$$HB = \beta_0 + \beta_1 \cdot P + \beta_2 \cdot v + \beta_3 \cdot h_d + \beta_4 \cdot v^2 + \beta_5 \cdot v \cdot h_d$$

Excerpt 2 (from \cite{127})

From that, they found the optimum 6mod in the following table.

<table>
<thead>
<tr>
<th>Run</th>
<th>P(mi)</th>
<th>H(mm)</th>
<th>v(mm/s)</th>
<th>h_d(mm)</th>
<th>HB mod</th>
<th>Test no.</th>
<th>Level</th>
<th>Level</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.05</td>
<td>0.19</td>
<td>58.76</td>
<td>112.45</td>
<td></td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Notice that P and hd are at the same level; only V is “almost in the middle” between 1300 and 1700.

From the analysis it turns out that that Hardness values 121.0 and 122.45 are NOT significantly different with α=5%.

If one had used the G-Method \cite{41, 50, 52, 55, 57, 60, 62, 67, 69, 73, 81, 85, 94-95, 99-101, 104, 109-112} and not Minitab, he would have found a better equation (using the same symbols of Excerpt 1…)

$$HB = \beta_0 + \beta_1 P + \beta_2 v + \beta_3 h_d + \beta_4 v^2 + \beta_5 v^3 + \beta_6 P h_d + \beta_7 v h_d$$

This equation is also confirmed by the interaction plot of Figure 7

\[\text{Figure 7. Interactions between the factors (data in Table 1): Normal distribution NOT needed}\]

Again we see that a NOAP journal “International Journal of Precision Engineering and Manufacturing” (fee not asked for publication) publishes papers with some problems: methods used that did not respect the assumption of the methods, conclusions drawn that did not consider the Confidence Intervals (CI), regression equations with cut coefficients, interactions not completely considered, …; to act correctly those authors should have transformed the data to get “normality” or to find the Theory for NONnormal data.

Transforming the data of Table 1 into “Normally distributed data” (using the Johnson transformation), we can find the following chart: it is clearly seen that run 6 provides the optimum setting (maximum response).

\[\text{Figure 8. Control Chart versus Runs: data transformed to Normal}\]

5. Control Charts with Exponentially Distributed Data. MINITAB Wrong

This author posted a question at site iSixSigma \cite{113} related to control charts: “control-charts-non-normal-distribution” asking for the “solution to two cases shown in a file”.

Both were related to the problem of finding if the process is In Control (IC) or Out Of Control (OOC); the solution of the two cases depend on the distribution of the data. the first case can be found in the book of D. C. Montgomery, with data following the exponential distribution; Montgomery dealt it wrongly in all the editions of the book, after 1996.

His solution was wrong and still it is because he, with his methods, decides that the process IC, when actually it is OOC; the “experts” of site iSixSigma \cite{113} did not wanted to consider the truth (process Out Of Control) and challenged F. Galetto about writing a “good” paper to be “Peer Reviewed” and, only later, to be published in a “Well-known Journal”. They did not believe the authors “scientific” ideas.

One participant at the discussion suggested the Minitab Software for analysing the data as “rare events” (according to him, T Charts were the good method to use).

Analysing Minitab “T Charts” it came out that they were wrong.

At that stage, the author posted the information and emailed Minitab Inc. asking the theory of the wrong T Charts.

The author and Minitab exchanged several e-mails; the conclusion (for MINITAB19) was:

\[\text{From MINITAB:}\]

1. There was no free technical support for the theory of
the T charts,
2. and they suggested me to consult a statistician
3. or to pay their Statistical Consulting service. (pay for a Wrong Method!!)

The author replied that they had to keep their WRONG method, and to sell it, WITH ERRORS, to their Customers, let them to "TAKE WRONG DECISIONS".

Notice that Minitab20 has still the same problem: December 16 2020. See Figure 1.

F. Galetto was asked to read the paper of Joel Smith [114].

Unfortunately, Control Limits provided by that “Peer Reviewed” paper, whose authors worked with Minitab Inc. are wrong.

The truth was rejected at iSixSigma [113] post.

A new challenge arouse for the author.

To understand the matter, the reader is asked to get the basics about the Shewhart Control Charts and the Individual Control Charts [7, 8] and the Reliability Integral Theory (RIT) [102-108] which allows to find the correct control limits of charts with exponentially distributed data; RIT was devised by the author in 1975 (45 years ago) well before the T Charts invention.

Incompetent professionals diffuse wrong ideas: Ignorance is flooding and overflowing!!!

We consider the Example 7.6 in the Montgomery book 7th edition. The data (named lifetime), in the Table 3, follow the exponential distribution; (we used Minitab 19 to show the problems):

<table>
<thead>
<tr>
<th>286</th>
<th>948</th>
<th>536</th>
<th>124</th>
<th>816</th>
<th>729</th>
<th>4</th>
<th>143</th>
<th>431</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>2837</td>
<td>596</td>
<td>81</td>
<td>227</td>
<td>603</td>
<td>492</td>
<td>1199</td>
<td>1214</td>
<td>2831</td>
<td>96</td>
</tr>
</tbody>
</table>

Since the data are few (20) and exponentially distributed one cannot use the usual formulae based on the Normal distribution. If one would [wrongly] do use formulae he would find the following Figure 9.

Montgomery, copying from Nelson, decided to transform the data from the Exponential distribution to the Weibull distribution and considered the transformed data as Normally distributed; so he used the usual formulae for the control limits (Figure 10):

![Figure 10](https://example.com/figure10.png)

**Figure 10.** Individual and Moving Range chart of “transformed” Montgomery data. Minitab 19 used (F. Galetto).

From Figure 10, Professor Montgomery decided that the Process was IC: actually, with the right method, the Process is OOC.

The same type of error is provided by MINITAB, with its T Charts. Another wrong method, publicized by E. Santiago, J. Smith in their wrong paper [114].

Quality Engineering has “Peer Reviewed” papers and is a trusted Journal, not asking any fee to the authors, but publishes wrong papers…

![Figure 11](https://example.com/figure11.png)

**Figure 11.** Montgomery data. (T Chart by Minitab 19 used by F. Galetto) (same with Minitab 20, 16 December 2020).

Notice the qualifications of the authors.
E. Santiago, a technical training specialist and J. Smith, a statistician, are working at Minitab; both have good qualifications. Their paper was Peer Reviewed and ended with thanks to W. H. Woodall (for his help to improve the paper) and two anonymous referees (for their comments to
improve the paper).

So this is the situation we are confronted with: qualified authors, one qualified reader (Dr. Woodall), qualified Referees and several other qualified readers.

None of them found that the paper has **WRONG Formulae for the Control Limits!**

These “wrong formulae are used by Minitab”, as well!
The authors did not pay any APC (Article Processing Charge) to a “Predatory Journal” …

Their paper is NO good!

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Using RIT [102-108], anybody can find the “Process is Out Of Control” (Figures 12-13). The green horizontal line (in Figure 12 with logarithmic scales) intercepts the ordinate axis at the Mean of the data; the abscissas of the points of interceptions of the green horizontal line with the Upper and Lower lines are the Lower and Upper Control Limits of the T Chart.

Moreover the Ranges are “Out Of Control”: they too are Exponentially distributed (see Figure 13) [104, 105].

In the Figure 13 the points (data) below the Lower Control Limit indicate “Process Out Of Control”!


Reader, what is your honest conclusion?

6. Estimation from Incomplete Samples

Often, in the Reliability Test (and field), we have “INCOMPLETE samples” of data: we have time to failure data and data (named suspensions) related to NON_failed items.

RIT provides the solution for estimating the MTTF, the failure rate, the Reliability, …

This problem of estimation from “INCOMPLETE samples” is GENERALLY not considered by statisticians and is not dealt in the Statistics books; they consider only the “COMPLETE samples” and they do not say that their formulae hold only for those type of samples (in the reliability field, all the data refer to failures).

Unfortunately, EVEN THOUGH they teach Reliability, many and many professors are not really experts in the Reliability Theory.

See the following exam exercise that has been given several times, by the author, to his student: 3 incompetent [Italian] authors wrote a reliability book written from which the case was taken: the reliability data (time to failure) of the test are assumed NORMALLY distributed!!!! [Macchina di prova stands for item on test, Tempo al guasto (ore) stands for Time To Failure (hours)]. 40 TTF were collected (sample complete: all the items failed). The authors (professors) say (in Italian)
Here is the Exam Exercise:

---

Excerpt 3. (An exam exercise given by Fausto Galetto to his students)

To pass the test the students, obviously, could not be as stupid as those professors! One of the 3 authors was very good (??); you could meet him at the SIX SIGMA lessons: Director of the Master on 6σ! He has excellent qualification: Taguchi Award Winner, MBB, author of 9 books,... In spite of that, he teaches wrong ideas. Is this professor able to solve the cases in the sections 4 and 5?

Will all those incompetent professors consider their responsibility to teach scientifically and to satisfy the learning needs of students and of the whole society. See (Figure 1), ...

There is NO Quality in teaching wrong ideas and methods! Teaching has to be scientific (Figure 1).

If those three incompetent profs. had studied the Theory they should have found the books about RIT and then ...

---

7. SPQR and OAJ versus NOAJ

We proved, and now it should be very clear, that NOAP have the same problems as have OAP: the authors have the primary responsibility of their papers quality; if the Referees are not really competent they are not able to see the errors [9-131].

The fee, asked by OAP, to authors does not influence their papers quality if they are truly competent. The "reputation of journals and magazines" [from 85 to 95, 126] does not assure the quality of the paper published.

See the following Inspection Plan with wrong detection [126] (from a QEG article in Research Gate): the authors of the paper write about the defectiveness of items checked in an Inspection Plan: the defectiveness (that obviously is varying because is the realisation of a random variable) has the mean value \( E(X) = \mu \beta \), caused by the wrong detection, where

1. "\( \mu \) is the probability that a product is REALLY defective"
2. "\( \alpha \) is the probability that a product, REALLY NON_defective, is WRONGLY detected as defective"
3. "\( \beta \) is the probability that a product, REALLY defective, is WRONGLY detected as NON_defective"

In F. Galetto’s opinion, \( E(X) \) cannot be the above formula.

He asked that to the expert scholars in RG: " What do the Research Gate experts think? " NO answer!

Those experts have been unable to use Logic SPQR to understand if the "proposed method" is to be applied or it must be refused.

Now it is evident the title of this paper: Quality of papers stems from authors and Quality of teaching stems from professors.

The following case is very illuminating: the origin of the Disquality Vicious Circle "Presumption-Ignorance-Presumption- Ignorance"(Figure 15, published on 2008 and related to Figure 14).

Some professors of various university organised (2001) a Design Of Experiment Post-Graduate course. F. Galetto decided to attend the course (as an "intelligent pupil") to see what the "Montgomery fans" would teach (also a QEG professor was teaching there!). The experience was quite negative: the professors were incapable to teach "scientifically" the subject.

After the author invented the Disquality Vicious Circle and published the paper [82] (with G. Pistone, M. P. Rogantin): during the course the two co-authors did not believe what you can find in the books [52, 67]. See also [109-111].

By presenting several papers in international Conferences [34-101, 111], and by writing several books [102-110],

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the author have been trying to diffuse the idea that decision-making has to be based on Scientific Methods.

See also [124, 125, 180], many documents (cases of wrong papers) in Research Gate and in Academia.edu.

The following case is very illuminating, as well: when the “students were defending their final thesis” (to get their degree in Engineering), Fausto Galetto used to open the written thesis at a “random” page and to ask the “graduating guy” what he meant with some statements found there. 90%-98% of the students did not know how to provide any answer to the questions: moreover, 50%-60% said “I copied it from the web!” That was not the biggest problem: it always was astonishing to see that the (Professors) Referees (as well) of the theses did not know the matter/answer themselves! These are hard facts, not opinions; the same facts were found by Deming and Gell-Mann…, and Einstein…

8. Conclusions (using SPQR)

We present here some few ideas about Quality. A longer set of them can be found in [112].

Professors, Scholars, Researchers and Managers have to stay with STEM (Science, Technology, Engineering and Mathematics), i.e. LOGIC to prevent and avoid DIS-quality! (see the Quality Tetralogy [104-112])

There are many methods misleading (e.g. Taguchi Methods, Bayes Methods, …); so the previous guys must be EDUCATED ON QUALITY.

They should always remember Deming’s statements [3] at pages 19, 129, 131; see Figure 1, as well.

Figure 14. FAUSTA GRATIA for Quality in order to avoid the Disquality.

Figure 15. The Disquality Vicious Circle.

The previous guys should think that there are two fundamental principles to use fully the thinking ability of people:

F1 Reality does exist in spite of human beings’ willingness and ability to recognize it.

F2 Variation is in everything and everywhere, all the time.

From F2 anybody can derive that “variation” is NOT the enemy of Quality, as several “intelligent (are they ????)” people [in the 6 Sigma field] say! Variation is in every phenomenon and is important: if life was developing for millions of years that was merit of the VARIATION! The sons of relatives have more problems than the sons of NON_relatives… Biodiversity is the foundation of ecosystems to which human well-being is intimately linked.

These hard facts have been seen by the author during his long experience in the Quality Field, as manager, professor, consultant and scholar.

I. Newton (great scientist) said “If I have seen farther than others, it is because I have stood on the shoulders of giants”; he used SPQR, without having invented it; before him Galileo Galilei, another great scientist, used it; after him, A. Einstein did the same.

Knowledge accumulation is a characteristic of the process of Science; the discoveries of one people generation serve for the future ones. This is true for any discipline (e.g. Logic, Mathematics, Physics, Probability, Statistics, Medicine, Economics, Reliability…): any building needs sound foundations.

Knowledge and the Knowledge-Making process must have Quality obtained through Quality Tools and Methods, as depicted in the Figures 14, 15, 16 Quality Tools and Quality Methods to avoid the Disquality.
Figure 16. Quality Tools and Quality Methods to avoid the Disquality.

Notice that Quality of papers or books does not depend on their number of citations and a paper cannot be considered “successful” when receiving more citations than those made, as suggested by QEG [an idea of Kosmulski (2011)]; QEG, disregarding completely Figures 14, 15, 16, decided \( [132] \) to propose to classify a publication as “successful” when it receives more citations than a specific comparison term \( (CT) \). They defined the \textit{success}-index as the number of successful papers, among a group of publications examined, such as those associated to a scientist or a journal. See \( [126-131] \) and think if a scholar can be like that…

Paper \( [97] \) shows the many drawbacks of this QEG attitude.

Using the SPQR Principle and taking into account that only the Scientific Attitude provides good results, any sensible Scholar can see the drawbacks both of OAP and NOAP: the bad quality of the paper published does not depend on the fee, asked by the OAP), but on the very low quality of the authors and of the Peer Reviewers; the same happens for “well reputed magazines and journals” (NOAP).

Remember Deming, Juran, Gell-Mann, Shewhart \( [3-8] \) and A. Einstein.

What we said can be extended to book publishers e.g. Wiley & Sons \( [9-13] \) and others \( [133-147] \) versus \( [102-110] \).

We think that all the relevant concept about Quality are embodied in the following two figures (17 and 18).

Figure 17. Opinions&Tool-box and Concepts&Methods

Figure 18. The epsilonQuality (\( \varepsilon Q \)) to Teach Quality (Qualitatem Docere) with Intellectual honesty (IO) and Gedanken Experimente (GE)

\( \varepsilon Q \) conveys the idea that Quality must be considered in every place, every activity and every time with IO and GE (ideas of Galilei and Einstein). Quality is very much related to sound concepts and Methods.

Every scholar must change his mind (\( \mu\text{eta'noia}, \) metanoia is a word of Deming) to devise good methods (\( \mu\varepsilon\theta\delta\omicron\omicron\) as in the following permanent sequence

\[
\Rightarrow \mu\text{eta'noia} \Rightarrow \mu\varepsilon\theta\delta\omicron\omicron \Rightarrow \mu\text{eta'noia} \Rightarrow
\]

\[
\Rightarrow \mu\varepsilon\theta\delta\omicron\omicron \Rightarrow \mu\text{eta'noia} \Rightarrow \mu\varepsilon\theta\delta\omicron\omicron \Rightarrow
\]

Why professors do not follow it?

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Biography

Fausto Galetto (born Italy 1942) received Electronics Engineering (1967) and Mathematics degrees (1973) from Bologna University; from 1992 to 2012 he was Professor of "Industrial Quality Management" at Politecnico of Turin; from 1998 to 2001 he was Chairman of the Working Committee "AICQ-Università" (AICQ) for Quality in Courses about Quality in Universities.

He wrote nine books and more than 200 papers on Reliability, Quality (Management, DOE, Applied Statistics, Testing, Process Control).

Reliability Engineer with General Electric, 2 years, before the $6\sum{6S(igMona)\text{movement}}$, from 1975 to 1982 Reliability Manager (Fiat Auto, now FCA); Quality Dept. Director (comprising the Reliability, Production Quality Control, and After Sales Department) with Philco Italiana for 3 years. 1985-1990 Director of the Quality/Reliability Dept. at Iveco-Fiat, since 1990 Quality Management consultant. Lecturer with the Italian Organisation for Quality Control (AICQ) and with COREP(1980-2012).


He left the SIS (Italian Statistical Society) and the AICQ (Italian Association for Quality) due to the ignorance and loss of commitment of their fellows and "Managers" about the Scientific Approach to Quality and to the related Quality Methods (Statistical and not...)

It seems he is one of the very few who take care of "Quality of Quality Methods used for making Quality".
ARTICLE

Determination of Business Strategies Using SWOT Analysis; Planning and Managing the Organizational Resources to Enhance Growth and Profitability

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ABSTRACT

A SWOT analysis is the method to evaluate the internal weaknesses and strengths of an organization as well as evaluating the threats and opportunities of its external environment. This is considered as an effective framework to plan and manage the organizational resources to achieve certain goals in a specific period of time. The purpose of implementing SWOT analysis in an organization is to formulate the strategy of a business based on existing internal and external factors. There may be several disadvantages associated with running a SWOT analysis; however, its efficiency in determining the future strategy of a business is more indeed. Although the origin of SWOT analysis is uncertain, there is a long historical background about its uses to facilitate the decision-making process in every complex environment. The final result of a SWOT analysis can be presented in a matrix which is a combination of the four factors and determines strengths and weaknesses that a company involves, with opportunities and threats that it may face. This article provides a study of SWOT analysis basics and provides several practical insights of steps to provide a SWOT matrix.

1. Introduction

Every organization needs business strategies to accomplish its goals in a specific timeline. Business strategies are known as high-level organizational plans that lead businesses towards their specific objectives [1]. Organizations search relevant data in their internal and external environment and by showcasing them through a SWOT analysis, provide different business scenarios that they may employ for the future of their business [5].

SWOT analysis is a simple but at the same time effective technique that has been used in the planning and management process of various businesses for the last 60 years and is connected to the weaknesses, strengths, threats and opportunities. SWOT analysis is helpful for decision-makers to provide effective strategies, policies, and improvements by examining the conditions of their internal and external environment and specific capabilities of that company. These internal and external factors may help or harm the business. Therefore, SWOT analysis is based on strategic planning to gain new perspectives and ideas by evaluating internal and external elements along with the current and future potentials of the business [9]. Consequently, the actual work starts after the SWOT chart

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is drawn.

To make a SWOT matrix, all aspects of the organization (various dimensions), as well as the opinions and views of all stakeholders, should be reviewed and unified to help understand the main trend or pattern of the company and ultimately achieve business goals. Accordingly, an identical version of SWOT cannot be used for all companies and every company needs a unique SWOT based on its situation, environment, and other relevant factors.

2. Definition of the SWOT Analysis

The SWOT framework involves a list of factors that affect the business objective and performance internally and externally. Opportunities and threats are posed by the external environment whereas strengths and weaknesses are related to internal issues.

Businesses use SWOT analysis as a strategic planning tool to ensure that their objectives are clearly defined for their future venture and project. Besides, this helps them to make sure that all factors that are relevant to their task, whether they are positive or negative, are identified clearly and also well-addressed. The SWOT analysis process involves considering four important areas including opportunities, threats, weaknesses and strengths. In the process of identifying important factors and classifying them, the focus is not solely limited to internal factors, but it is also about realizing external elements that may influence the success or failure of the organization.

External opportunities and internal strengths help an organization to achieve its objectives. These are known as positive factors for organizations in the path of meeting their targets. On the other hand, external threats and internal weaknesses are known as factors that negatively affect the organization to achieve its objectives and are considered unfavorable for organizations. Therefore, determining any successful strategy for the future of businesses is a result of analyzing a selection of internal weaknesses and strengths in relation to the external opportunities and threats that are posed by the surrounding environment. In other words, a manager that plans the strategy for an organization should consider the analysis of internalities and externalities and plan a strategy that helps the organization to get the most out of its weaknesses and strengths in the light of external threats and opportunities.

To identify the external and internal factors that every organization faces, a comprehensive analysis should be conducted. On one hand, these factors may be potential incentives for an organization. On the other hand, they could be factors that limit the organization to achieve its goals and intentions. The result of the SWOT analysis can be presented in a matrix that is a combination of four areas reflecting internal and external factors. This will determine the final strategy that can guide an organization through its long-term progress.

Items listed in a SWOT chart in every section of strength, weakness, opportunity, and threat influence each other (also have an impact on other aspects of the business) and make a matrix that results in a more complex SWOT but is an efficient way to solve the problems originated from the chart analysis. According to Figure 1, TRIZ model of a SWOT, internal organizational strengths provide opportunities and can also counteract weaknesses. Besides, weaknesses create threats and can also counteract opportunities. In addition, opportunities can be countered by threats. It is important to note that it is not necessary to make a long list of items for each factor. It is important to have a fishbone model to see the reason why these items are considered as threats, opportunities, weaknesses and strengths.

3. Main Purpose of Employing the SWOT Analysis

The main purpose to use SWOT analysis is to approach new opportunities by empowering strengths and also to reduce or stop the progress of threats by recognizing and eliminating weaknesses in an integrated framework.

The integral purpose that SWOT follows to achieve is identifying the strategies that provide a business model for the firm that best fits its operations by employing organizational resources and specifications in alignment with environmental factors. SWOT is all about conducting a study to realize environmental factors that may affect the firm and finally use it as a tool to predict the future trends. This will facilitate the decision-making processes in organizations that have always been accompanied with difficulties.

Another common use of SWOT is in cases where an alternative appears all of a sudden and should be analyzed with regard to the decision-making process. SWOT analysis is generally known as a method to formulate the organizational strategy.
The purpose that managers and decision-makers follow by employing SWOT is to acquire a comprehensive understanding about all potential internal and external factors that may impact the success or failure of their projects. Any ignorance to identify a key weakness, strength, threat or opportunity may lead a business to make poor decisions.

4. Steps to Run a SWOT Analysis

The following steps are considered as the main steps to run a SWOT analysis in different business:

1) Find the objectives of carrying out a SWOT analysis.
2) Investigate situations of the business, industry and market.
3) Identify strengths of your business and list them.
4) Realize weaknesses of your business as well as your industry and categorize them.
5) Identify potential opportunities and perspectives of your industry and classify them.
6) List and organize potential threats for your business.
7) Find priorities from the SWOT elements and analyze them.
8) Develop a strategy that best addresses the issues and challenges of your internal and external environment.

5. Advantages and Disadvantages of the SWOT Analysis

Collins-Kreiner and Wall state that SWOT analysis is a simple and at the same time useful method to organize information, specifically for preliminary research. They emphasize that it is also considered as a foundation for theoretical work. One of the advantages of SWOT analysis that is also considered as a disadvantage at the same time is that it is known as the method of evaluation. The evaluation of the work is more applied than its theoretical ones.

SWOT is recognized as a useful method to understand the environment that an organization operates, and as a result, it would be beneficial in strategic planning that determines the future growth and development of a business.

Organizational policies and business strategies may change as a result of the dynamic digital era. Organizational or business structures may lead to complex issues and limitations. In these cases, there is a possibility for the SWOT analysis to fail. SWOT may be unsuccessful to help managers in their decision-making process by providing a great amount of information and data, and it may neither provide solutions for a business nor prioritize the challenges and issues.

A number of advantages and disadvantages of the SWOT analysis are listed below:

5.1 PROS

1) Understanding the external factors as well as internal capabilities can be provided by referring to factual data;
2) There would be a chance for businesses for evaluating external opportunities and threats;
3) There would be a factual evaluation of organization's weaknesses and strengths in comparison to its competitors;
4) It provides a new understanding of the position of the organization in the competitive market;

5.2 CONS

1) It may be time consuming;
2) Past data may be used for analysis and accessibility to present data may be limited;
3) There may be different opinions as a result of differently analyzing the SWOT matrix;
4) Results are often a list of information with incomplete, superficial, or inaccurate items;
5) It is not possible to quantify the effect of strategic factors on alternatives.

6. Conclusions

A SWOT analysis determines the strengths and weaknesses that a company involves, with opportunities and threats it may face. In the SWOT matrix, strengths are evaluated to identify the company's competitive advantages, weaknesses are assessed to identify the lack of vital firm capabilities, opportunities to identify new growth and development paths, and threats to change the company's external and environmental parts. The alignment of the factors listed in the SWOT matrix and the impact of each one on the other is important to be taken into account.

Some scientists, however, believe that in the SWOT matrix environmental factors are oversimplified in some cases and the results may even be far from reality. Nevertheless, many experts still consider SWOT, with all its flaws, an efficient method for strategic planning. SWOT analysis not only is a guide for business planning but also is a helping tool with personal decisions.

References


REVIEW

Population Change vs Natural Geography in Asia: A Sociological Appraisal

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Abstract

Population is a phenomenon ever changing more positively rather than the vice versa. It is more increasing in Asian countries. The increase of population in Asia is not compatible with the geographical size and capacity of the countries concerned. Through the process of urbanization, and in the form of migration, a large number of people have left their birth lands for cities and new lands. Such a change over contributes to overpopulation, pollution and environmental issues in the new areas and under population in birth lands; villages and cities. Such a transition creates complex issues in the new destinations which are sociologically worth appraising.

1. Mini Review Article

The present research appraises how population is rapidly increasing in Asian countries while the size and geography of such countries do not change. This emerging controversy has led to increasing socio-environmental complexities and issues in such places. Population change is a man-made phenomenon, and under the influence of science and technology. On the other hand, overpopulation in countries causes natural resources to change and become industrial-related. Such a conversion is currently occurring in many Asian countries lead to lots of geographical and human problems so far as their food, water and oxygen are concerned. Because of such geographical and demographic change, many people are in great trouble in such countries. The gap between the two contributes to further urbanization and increasing crowdedness of cities. Such a situation has led to increasing price of housing followed by delayed marriages, ever-lasting singlehood, and cohabitation which is recognized unethical and unlawful in some countries. The existing situation has driven many younger people to social, economic and demographic changes. While generation gap was not much observable in the past, in modern time, it is considerably observable. New generations in cities are widely educated, and prone to more education which are drivers of further change. The given transition has contributed to a wide range of norms and values of people in the existing cities in many Asian countries. Such transitions need sociological assessments and analyses, as population being changeable and...
the geography being stable. However, social engineering or sociology provides policy-makers with updated awareness to decide how to engineer their countries. To do the present research, various paradigms were used to find out the facts and figures necessary.

Speed of industrialization followed by gradual urbanization highly affects population growth rate. So, when population migrates to cities, urban culture is learnt and used. We currently see many cities with high population density, which are facing increasing prices, increasing economic inflation, changing cultural values and the like. Asia with a size of about 44 million km2, as the largest continent of the world is also having 4.6 billion population \[12\]. Under the circumstantial movement of people, the natural geography of Asia has widely changed — many parts of which are not used, and remained dead. Many of the Asian countries such as Bangladesh, India, the Philippines, Vietnam, Thailand, Pakistan, China and Sri Lanka are among the countries being affected by the extreme risk of climate change \[11\]. Since late 1990s the economies of both China and India have been growing rapidly in Asia with an average annual growth rate of more than 8\% \[4\]. The economic growth of these populous countries was accompanied by educational growth of younger cohorts—lowering population growth rate not only in China and India, but other countries in the continent followed suit as well. Such a change also affected many socio-cultural norms and values in the region. Though Total Fertility Rate (TFR) is the age range 15-44, yet education continuation in cities has increased from age 15 up to the ages 27-30, or upper, where fertility is lowered, and fewer children are born within young generations. It is worth mentioning that in less developed countries, TFR is as high as 5 children for a woman, whereas this variable is 2 or even less in developed countries. In other words, shortage of doctors, nurses, hospitals and medicine play a determining role in increasing the children born in some parts of Asia. Population policies are indicative of population change. Demography as the study of population statistics comprising of birth rates, death rates and migration rates, all such statistics are investigated through censuses and surveys conducted in geographies over a period of time \[9\]. Population policies are the active measures to reduce the birth numbers. One-child policy in China between 1979-2014 prevented about 600 million babies to be born in that country \[3\]. Increasing education also widely affects child birth as a population policy in countries/geographies.

2. Economics and Resources

This discusses the relationship between supply and demand and the allocation of natural resources. Economists study the sources of communication between economic and natural systems; With the aim of achieving an efficient and sustainable economy. Hence, from the perspective of economic sociology, there is a significant relationship between economics and resources. Also, population size, population growth trend and density must always be related to resources in its general sense and natural resources in its specific meaning. While population growth increases in the form of geometric progression \[1,2,4,8\], resource growth occurs in the form of arithmetic progression \[1,2,3,4,5\]. If there is a gap between demographic variables and resources in the general sense, one should expect challenges, contradictions and weaknesses in the coming years and over time.

The trend of increasing life expectancy and declining population in Japan, for example, has led to economic proportions and resources or territory in that society. If Japan increased its population more than it does now, it would face more resource constraints. For this reason, in order to create a balance between population and resources, since the 1950s, it has always adapted population, fertility, manpower, and population growth in general. In this way, by creating such a proportion, a high level of productivity has been achieved and as a result, the GDP has increased. This situation has led to more economic progress in a continuous and sequential manner. Therefore, other countries should always use the economic and social plans and policies and conserve the resources of other countries, including Japan. According to Weismann’s theory or worldview, a world with a smaller population and a wider nature makes the connection between the economy and the land smoother. Hence, and from the point of view of economic sociology, the relationship between these two variables must always be considered. More developed societies generally maintained this proportion during the twentieth century and subsequently achieved a more advanced economic position. However, less developed countries, which did not respect the relationship between population and resources, face economic weaknesses and the resulting turmoil. They have become. While the world’s population will reach ten billion or more by the end of the 21st century, the gap between means and ends remains unfilled. This means that predetermined goals cannot be achieved. Therefore, in order to achieve economic development, resources must always be provided. Economic development in addition to providing manpower, its natural resources must be provided in a sustainable way. Otherwise, economic development will not be achievable. Therefore, in order to access resources, the agricultural sector as a supporter of industrial production must always be stable and active.
In the absence of adequate oversight of primary resources and the agricultural sector being overshadowed by industrial development and the expansion of urban geographical areas, this move itself will face economic expansion with obstacles to raw materials. Countries like China and India today in Asia have given high priority to their agricultural sector to advance their industrial and economic goals. Japan with its economic characteristics; this means that the third country in the world in terms of GDP, the fourth country in terms of purchasing power parity and the second most developed country in the world must always provide the necessary economic resources. The industrial and economic management of that country actively procures and supplies raw materials and resources from different parts of the world; simply because the cycle of economic production in different parts of the country does not stop. Japan’s economic and industrial policy mission is to test and diligently rebuild its economic and industrial systems; in order to ensure the bright future of the country [3]. Thus, as much as manpower is important in the economy, raw materials will be just as important. Not only Japan but other industrialized nations have followed suit throughout the twentieth century. Although manpower has dwindled in many industrialized countries during the twentieth century, it has itself been provided through the reception of migrant workers. But at the same time, the supply and supply of raw materials from other parts of the world has continued, and continues to continue.

Severe dependence on imported fuel resources and declining human resources has created economic challenges for that country (Japan). While even Japan has faced challenges with all its calculations, futures, and continuous monitoring of demographic indicators; That is, an increase in the elderly population on the one hand, and a shortage of manpower on the other, other less developed countries will naturally face more challenges and turmoil.

While Japan is making tremendous use of advanced technologies that replace manpower, it is still facing a shortage of manpower. Japanese industrial companies are always looking to retain their personnel in the labor market, and that is due to the shortage of manpower and increasing aging in that country [6]. In order to provide it, it must always provide appropriate policies that are appropriate to the situation. For example, because the manpower shortage is so palpable in that society, and on the other hand, the elderly and parents also provide direct services to their working children, this country has recently turned the work of many women in that society into part-time. So that such manpower can play their caring role as well as their caring role. Also, in order to provide manpower, it has assigned two to three jobs to many employees in order to fill the manpower gap as much as possible. Therefore, the labor and manpower planning system must always and flexibly formulate and use newer policies and plans.

There seems to be a demographic-economic paradox in Asia. There is an inverse relationship between population and economy within and between nations. Population growth, high population size, high fertility rate and factors such as these greatly affect economic frameworks, so that the supply of labor and employment is not commensurate with the population seeking work and the skilled people. The demographic-economic paradox is described as nations and populations with high GDP per capita are those with fewer children (1). This paradox or demographic-economic interaction is seen in most developing Asian countries today. Therefore, developing countries should always have control over their population trends such as fertility, range of fertility, number of births, population migration from rural and agricultural sectors to industrial and service sectors. Otherwise, the mentioned paradox becomes more and more objective and apparent, which has its own economic and social consequences and challenges.

### Table 1. Total fertility rate in Southeast Asia 2016 (Average number of live births for a woman)

<table>
<thead>
<tr>
<th>Country Name</th>
<th>Total Fertility Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore</td>
<td>1.2</td>
</tr>
<tr>
<td>Thailand</td>
<td>1.5</td>
</tr>
<tr>
<td>Brunei</td>
<td>1.8</td>
</tr>
<tr>
<td>Vietnam</td>
<td>2</td>
</tr>
<tr>
<td>Myanmar</td>
<td>2.2</td>
</tr>
<tr>
<td>Indonesia</td>
<td>2.4</td>
</tr>
<tr>
<td>Philippines</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Source: Statista. [10]

In proportion to the increase in literacy and per capita (GDP), the number of children has decreased, especially in industrial societies. This means that following the literacy of women and their entry into the labor market, birth rate has gradually declined, and on the other hand, following the per capita increase in GDP, or in other words, per capita income, the economic way of life and the social strata have been affected. Consequently, families’ lifestyles and their expectations largely led families to less fertility. This trend has continued over the past 70 years, and is still ongoing. This has caused many societies even face a shortage of manpower. According to the Indian Minister of Population Karan Singh in 1974- Conference in Bucharest (Romania), development is the best means of population prevention. Countries that achieve economic development, gradually become more disciplined.
References


ARTICLE

Human Rights and Social Justice through Open Educational Resources and Lifelong Learning

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ABSTRACT

A landmark in the realization of UNESCO’s Sustainability Goals, Education for All (SDG4), was passed when the organization’s Recommendation of Open Educational Resources (OER) was uniformly adopted in 2019. Now it is time to transfer from the consciousness of OER to their mainstream realization at all levels, micro, meso, and macro, including all stakeholders, such as governments, institutions, academics, teachers, administrators, librarians, students, learners, and the civil service. The OER Recommendation includes five areas: building capacity and utilizing OER; developing supportive policies; ensuring effectiveness; promoting the creation of sustainable OER models; promoting and facilitating international collaboration; monitoring and evaluation. OER are valued as a catalyst for innovation and the achievement of UNESCO’s SDG 4, education for all, lifelong learning, social justice, and human rights. The OER Recommendation will be a catalyst for the realization of several other SDGs. Because access to quality OER concerns human rights and social justice, this Recommendation is vital. In 2020, the effects of the worldwide COVID-19 pandemic clearly demonstrated the importance of opening up education and the access to internationally recognized, qualified learning resources. This article describes and discusses how the promise of resilient, sustainable quality open education can be fulfilled in the new normal and the next normal.

1. Introduction

In November 2019, a milestone in achieving UNESCO’s Sustainability Goals (SDG), Education for All (SDG4), was passed when the Recommendation for the implementation of UNESCO’s Open Educational Resources (OER) was uniformly adopted by nearly 200 member states of the United Nations (UN). This Recommendation was only the 12th of its kind by UNESCO, and just the second one which was adopted in full both in content, format and outline, which calls for conclusions to be drawn about its meaning. It is time to transfer from the consciousness to mainstream realization at all levels, micro, meso, and macro, including all stakeholders, such as governments, institutions, academics, teachers, administrators, librarians, students, and all learners. The civil service is responsible for the implementation of OER at the public level. The OER Recommendation includes five areas: building capacity and utilizing OER; developing supportive policies; ensuring effectiveness; promoting

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sustainability models of OER; promoting and enabling global collaboration; monitoring and evaluation \cite{1,2,3}.

OER are valued as catalysts for innovation and for achieving the SDG4, lifelong learning, social justice, and human rights \cite{4}. The execution of the OER Recommendation will be a catalyst for the realization of at least six SDGs: SDG 4 (quality education); SDG 5 (gender equality); SDG 9 (industry, innovation, and infrastructure); SDG 10 (reduced inequalities within and between countries); SDG 16 (peace, justice, and strong institutions); and SDG 17 (partnerships to achieve these goals) \cite{2}. Because access to quality OER concerns human rights and social justice, this Recommendation is vital. In 2020, the global COVID-19 pandemic clearly demonstrated the importance of opening up education and the access to internationally recognized, qualified learning resources \cite{5,6,7}. Moreover, the pandemic has taught us lessons about the value of a culture of sharing.

This article describes and discusses how OER serve as a game changer for novelty, lifelong learning, human rights, and social justice, which will shape the new normal, the next normal, and the fulfillment of the promise of resilient, sustainable quality education in what has been defined as the post-pandemic era.

After this short introduction, the methodology of this study is briefly outlined, followed by a background including global challenges, open education, UNESCO’s SDGs, SDG4, the CPT+10. Then the main focus of this article, OER, lifelong learning, and COVID-19 are presented. Finally, this article ends with a discussion, conclusions, and recommendations for future research.

2. Methodology

This article is more a theoretical paper grounded on literature research, than grounded on experimental research. The author is ICDE Ambassador for the advocacy of OER worldwide, and chairs the International Council for Open and Distance Education (ICDE) OER Advocacy Committee. The author does not claim to provide an extensive overview of developments in the field and in the world in this article, but rather an overview is provided.

3. Background

Before discussing the main topic of this article, which is OER, some global megatrends and challenges are outlined, as well as the UN and UNESCO’s SDGs and challenges for universities, such as open education and the modernization of higher education.

3.1 Main Global Challenges

Globally, four major challenges are underscored: globalization, demographic change, increasing digital transformation, and technological expansion, all of which affect the world and daily life, and will continue to shape the future \cite{8}. Because they affect education to a very large extent, its position needs to be re-calibrated. At large, the character of schooling is to coach individuals to resolve difficulties both straightforward and potential ones, and even unfamiliar concerns. Specifically, education aims to educate the public and individuals in societies to solve complications in society and the world that have not yet been identified, using procedures and techniques that have not yet been developed. Therefore, yesterday’s procedures and techniques cannot be used to train today’s learners for a future that we cannot predict. Therefore, the role of lifelong learning is more relevant than ever \cite{9}. In higher education, the challenge is to modernize, especially through the practice of seamless learning, and to promote the same, as well as to cultivate a culture of openness and the practice of OER \cite{9}.

Schwab \cite{10}, Schwab and Davis \cite{11}, the World Economic Forum (WEF), and the Davos Conference in 2016 argued that the Fourth Industrial Revolution (4IR) \cite{8} has changed everything from how we relate to each other, to the work we do, to economic and human concerns. Yet there are global needs to help shape the future we want to live in. The question is what is needed to make this happen and what needs to be known to make this happen. There is evidence that the 4IR is more about the requirements of a social revolution than just technology and digitization. Schwab \cite{10}, Schwab and Davis \cite{11} and the WEF \cite{8} argue that the 4IR will affect the way we live, work, learn, connect, network, collaborate and relate to each other. Moreover, the social revolution affects emotions, empathy, ethics, values, identity, “just for me” and “just in time” learning, and personal interests. In addition, they emphasized that education and learning must include social justice, human rights, and well-being. They also emphasized that global megatrends affect people, culture, society, civilization, the physical ecosystem, as well as the global economy. It is noteworthy that the focus is on human communication and how people and civilizations respond or fail to respond to large-scale encounters.

3.2 Open Education

Open education is an umbrella term under which various interpretations of open education are housed, with diversity at the level of open. However, in most of the interpretations OER plays a supporting role \cite{12,13}. Globally, open education has increasingly become part of conventional education provision \cite{14}. To achieve several of the UNESCO SDGs, the role of open education is critical \cite{1}.
SDG4, for example, emphasizes access, equity, equality, inclusivity, quality, and lifelong learning. Many manifestations of open education, even including the use of OER, will promote greater access along the lifelong learning continuum [5, 6]. Open education is one of many open movements. The open education society is seen as part of a larger movement to promote Open Access to knowledge that supports cultures of sharing. In addition, open pedagogy, open research, open data, a culture of sharing, and copyright reform are also critical, as is the use of Creative Commons licenses. Other broad open movements characterize movements that seek openness in other ways, including free and open-source software, administration, management, and governance, in addition to an open culture. As the open education movement moves into the next decade, it should consider how to achieve these common goals [15, 16].

Through open education, affordable, appropriate, and meaningful educational opportunities can be accessible to everyone at every stage of their lives and professional development. This includes access to content, courses, support, evaluation, and documentation in ways that are seemingly unlimited, elastic, diverse, and responsive to different needs. Barriers related to access and cost, for example, are condensed or removed. For example, there are now Open Access publication requirements and guidelines worldwide OER. In addition, a growing number of advocates, scholars, and experts worldwide are committed to strengthening international and large-scale networks for open education and OER [14, 17, 20, 21].

In European higher education, open education is becoming increasingly important as the digital transformation is one of the key catalysts for the modernization of education. However, open education does not only refer to opening educational materials under an open license. Nor does it only mean the accessibility of Open Access research in repositories. However, both should be encompassed in the comprehensive conception of open education. The practice of digital technologies in teaching and learning is no longer restricted to open universities or virtual universities, but has spread to all categories of institutions, both established and unconventional.

The European Research Center (JRC) has acknowledged a framework for the openness of universities [12]. This is based on a comprehensive definition of open education that takes into account different practices that aim to support the ecosystem, as well as transparency with a universal methodology in practice. It attempts to go beyond OER, MOOC and Open Access and includes 10 dimensions of openness. The framework can be used as a tool by educational organizations to make tactical decisions about pedagogical methods, partnerships between individuals and institutions, recognition of non-formal learning, and different ways of delivering content. Because open education is now largely enabled by information and communication technologies (ICTs), there are almost limitless opportunities for advances that contribute to the transformation of higher education. Open education has a strong link to SDG4, which is briefly summarized in the following section.

3.3 UNESCO Sustainability Development Goals

When the United Nations and UNESCO SDGs were presented, a specific goal was dedicated to education, SDG4, because education, and in particular the position of open education, has an impact on the others in one way or another, either directly, or it promotes innovation in some of the SDGs, or it will lead to an impact on others. Globally, open education is becoming more commonplace, and SDG4 emphasizes that the use of OER will support expanded access in lifelong learning [5, 6, 22].

SDG4 emphasizes access, equity, equality, inclusion, quality and lifelong learning and includes several dimensions of open education [22]. SDG4 contains 10 targets, seven of which are expected follow-on targets and three are the means to achieve them: 4.1 - Universal primary and secondary education; 4.2 - Early childhood development and universal pre-primary education; 4.3 - Equitable access to technical, vocational and higher education; 4.4 - Relevant skills for decent work; 4.5 - Gender equality and inclusion; 4.6 - Universal youth literacy; 4.7 - Education for sustainable development and global citizenship. The three means of executing SDG4 are about effective learning circumstances, grants and teachers and educationalists [18].

The Cape Town Open Education Declaration is a major international statement on Human rights, Social justice, Open Access, Open Education and OER [15]. It is based on the principle that everyone has the freedom to use, adapt, improve and attribute educational resources without reservation. The Cape Town Declaration in 2007 was followed up 10 years later by the Cape Town Open Education Declaration 10th Anniversary [16].

3.4 CPT +10

The Cape Town Open Education Declaration celebrated its 10th anniversary in 2017. In conjunction with this anniversary of the Cape Town Open Education Declaration, 10 directions for promoting open education were presented in CPT+10 [16].

Over the past decade, the focus of the open education
movement has been on the creation and adoption of OER. Some of the most extraordinary frontier areas of open education lie in open pedagogy, broadly understood as teaching and learning practices empowered by the capability to preserve, reuse, revise, remix, and share educational materials. The open ecosystem facilitates educators to break free from the confines of static textbooks and old-fashioned assignments and open the door to imaginative, collaborative, and engaging educational capabilities that help transform teaching and learning for the future [16].

The basic idea of going beyond the classical textbook has been at the heart of the open education movement from the beginning. In the last era, however, some works have been pushed in the opposite direction by OER. Making open textbooks look, feel, and function like traditional books has proven to be a very effective support tactic under compelling circumstances. This work has made remarkable strides in intensifying practice and recognition OER. Nonetheless, the open education society should respond to the fact that the strategy of linking OER to textbooks limits the inspiration of teachers and learners in relation to current technology-enabled open learning materials. CPT +10 provided the following 10 courses [16]:

- Communicate openly: Take the message of open education into the mainstream.
- Empower the Next Generation: The open education movement needs to focus on the next generation.
- Connect with others: The movement becomes stronger by working with allied movements.
- Open education for development: Opening new opportunities for education supports development.
- Open pedagogy: Harnessing the power of open teaching and learning.
- Thinking outside the institution: Enabling anyone anywhere to learn anything.
- Data and Analytics: Explore the intersection of open content, open data, and open learning.
- Beyond the textbook: Create the open learning materials of the future.
- Open publicly funded resources: Publicly funded educational resources should be openly licensed by default.
- Copyright reform for education: Copyright reform and advocacy for open education are two sides of the same coin.

4. Open Educational Resources

The concept Open Educational Resources was coined and first used in 2002 in Paris at a conference hosted by UNESCO. Almost 20 years later, in 2019, a Recommendation on the implementation of OER was unanimously adopted after several years declarations and conferences, by all UNESCO members, which represents a breakthrough in the field [10, 13, 23, 24].

4.1 The UNESCO OER Recommendation

In November 2019, at the General Conference of UNESCO, the member states of UNESCO adopted the OER Recommendation for implementation and agreed to strengthen their promise to open knowledge sharing and learning [25]. This was a significant milestone in the history and development of quality resources for all and for open education advocates. This Recommendation had its foundation from several conferences and statements already since the Paris UNESCO conference 2002, when the term OER was coined. Consequently, Paris Declaration [26], Cape Town Open Education Declaration, Anniversary 10+ [15] and Ljubljana Declaration [24] were declared in the foundation of the OER Recommendation for implementation 2019.

The OER Recommendation will have an impact to the achievement of at least six of the SDGs: SDG4 (quality education), SDG5 (gender equality), SDG9 (industry, innovation and infrastructure), SDG10 (reducing inequalities within and between countries), SDG16 (peace, justice and strong institutions) and SDG17 (partnerships to achieve these goals) [25]. Access to quality OER is related to human rights and social justice, which is why this Recommendation is of utmost importance.

OER offer promising solutions for accessing, creating, sharing, and supporting learning at all grade levels. OER offer benefits to teachers, parents, education policy makers, and government agencies [15, 16, 27, 28, 29, 30, 31, 32, 33]. In addition, OER is valuable to a variety of groups, involving cultural establishments (e.g., libraries, archives, and museums), and their users, academics, civil society establishments (e.g., professional and student associations), publishers, the public and private sectors, intergovernmental organizations, copyright holders, authors, media, and broadcast groups. OER can support to meet the requirements of individuals, involving people with disabilities and those from marginalized or underprivileged, and vulnerable groups. It can be used to magnificently encourage gender equality and encourage ground-breaking educational, didactic and methodological advances. The OER Recommendation focuses on the next five areas [4, 25]:

- Capacity building and use of OER: Develop the capability of all key stakeholders in education to create, access, reuse, adapt, share and apply open licenses for OER in means coherent with national copyright laws and international agreements.
- Develop supportive policies: governments and educational authorities and institutions should be confident to
launch legal structures to maintain the open licensing of publicly financed educational and research materials and to develop policies that enable the use and modification of OER to encourage high-quality, comprehensive education and lifelong learning for all, sustained by significant research in this area.

- Ensure effective, inclusive and equitable access to quality OER: Encourage the implementation of strategies and programs, embracing applicable technology solutions, that ensure OER is standardized in any channels and distributed in open designs to extend equitable access, co-creation, curation and searchability, including people in vulnerable groups and people with disabilities.

- Promote the creation of sustainability models for OER: Support and promote the establishment of sustainability models of OER at national, regional and institutional levels, and the development and examination of new resilient practices of education and learning.

- Encourage and facilitate global collaboration: support worldwide collaboration among actors to reduce redundant replication of investment OER. Cultivate a universal pool of culturally diverse, locally appropriate, gender-sensitive, user-friendly learning materials in various languages and designs.

To support member states in successfully implementing the OER Recommendation, the UNESCO OER Dynamic Coalition was launched in March 2020. The Coalition is a multi-stakeholder group of associates devoted to sharing proficiency in encouragement of collaborative movements and employment of the OER Recommendation.

Since its adoption in November 2019, the definition of OER has been revised as follows:

OERs are learning, teaching, and research materials in any format and medium, which are publicly available or are protected by copyright under an open license allowing free access, reuse, reutilization, adaptation, and redistribution by others.

The adoption and use of OER are strongly linked to the four Creative Commons (CC) conditions BY (Attribution), SA (Share Alike), NC (Non-Commercial) and ND (No Derivatives), which can be shared in six means to describe what they permit and how open or locked they are. All six variants have CC BY at the beginning, which means that the author is always recognized. As can be understood in Figure 1, the utmost open are Public Domain (PD) and CC BY and CC SA. The most inaccessible ones are Copyright, all rights reserved, CC BY, CC NC and CC ND.

The concepts "open content" and "open educational resources" define any copyrightable work (conventionally omitting software, which is designated by other concepts such as "open source") that is authorized in a way that gives users unrestricted and perpetual approval to partake in Wiley's 5R activities (retain, reuse, revise, remix, and redistribute (Table 1).
5. A Culture of Lifelong Learning

The lifelong learning initiative by UNESCO is based on the premise that the creation of a global lifelong learning ethos is essential to address the encounters that humanity faces, such as environmental catastrophe, high-tech and demographic change, the pandemic COVID-19 and the inequalities it exacerbates. The policy agenda must prioritize lifelong learning beyond education and labor market policies. It is distinguished that the impact of COVID-19 on communities is severe, but it also calls for an opportunity to reflect on how learning can better contribute to the creation of sustainable and inclusive societies in which people participate as active and global citizens. Overcoming prevailing barriers, encouraging participation and ensuring that services are equitable, open and participatory have been explored in the Lifelong Learning Initiative by UNESCO.

All over the world, even in the richest economies, people face economic and other difficulties that prevent them from learning and from realizing their potential. The complexity and multidimensionality of the challenges people face require ecosystem execution and a holistic vision of lifelong learning. Further disruption will be caused by climate change, demographic change and labor market transformation during the 4IR. Therefore, the adoption and realization of open education and OER are critical to the success of quality education for all as predicted by SDG4.

This UNESCO work on lifelong learning contributed to the UNESCO Futures of Education, Learning to Become action. Lifelong learning intensifies the ability to follow change and shape the future, which is of paramount importance given the disruptions and uncertainties posed by the threats and opportunities of demographic change, the climate crisis, rapid technological advances, and the COVID-19 pandemic. The initiative reflects the potential impact of lifelong learning in transforming schooling and generating a resilient, ecological, healthful and comprehensive forthcoming. It offers a compelling foresight of lifelong learning and the beliefs and values that essentially strengthen it. It addresses the global society to deliberate education as both a civic and private value and to identify that lifelong learning is a novel human right. The UNESCO Institute for Lifelong Learning (UIL) Director David Atchoarena noted that we are leaving behind an era portrayed by an extreme focus on the professional and skills measurements of lifelong learning. Recognition of the complexity and multidimensional description of the encounters fronting humankind involves the renewal of a universal foresight of lifelong learning. Moreover, he stressed that due to the expected further dislocations caused by the consequences of climate change, demographic change and the fundamental transformation of the labor market through the 4IR, lifelong learning must be prioritized in the policy agenda beyond the fields of education and labor market policies.

The Lifelong Learning Report outlined the key characters of the empowering ecosystem needed to ensure that lifelong learning is the guiding principle of education and policy and to provide chances for lifelong learning for people regardless of their background or context. Looking to the future, 10 key messages are set out that are critical for generating a culture of lifelong learning:
- Identify the universal nature of lifelong learning.
- Encourage transdisciplinary exploration and cross-sectoral partnership for lifelong learning.
- Position disadvantaged groups at the heart of the lifelong learning program.
- Dedicate lifelong learning as a public good.
- Guarantee better and fair access to learning knowledge.
- Alter educational institutions into lifelong learning establishments.
- Acknowledge and endorse the united facets of learning.
- Inspire and encourage lifelong learning initiatives at local levels incorporating learning cities.
- Improve and regenerate learning at workplaces.
- Acknowledge lifelong learning as social justice and a human right.

UNESCO emphasized that a vision of lifelong learning must be embedded in a broad understanding of the future. Therefore, a shared vision that explores the potential of lifelong learning from the perspective of each discipline is crucial. At the same time, the vision focuses on learners (i.e., incentives, talents, and learning processes) and on the social dimensions of learning (i.e., learning as a collective endeavor that strengthens a sense of community). By 2050, the realization of this vision will have led to a profound cultural shift based on a solid awareness of the potential of learning. Societies will self-consciously aspire to be learning societies, and people will recognize themselves as lifelong learners. As an ethos of continuous learning will permeate all areas of life, education will be perceived as much more than simply completing a course. Lifelong learning will have fundamentally changed the way the traditional life course is perceived and how individuals deal with its complexity. Learning trajectories will no longer be tied to the categories of age and formal education. Life choices will have become more diverse, and education and learning will take place throughout the life course. Formal, non-formal and informal learning activi-
ties will permeate all dimensions of life, including work, family, civic engagement and leisure, as summarized in the 4IR. Regardless of age, method, or context, learners will be able to learn whatever they want to update their knowledge or skills, adapt to an ever-changing ecosystem, get a better job, or simply for the joy of expanding their skills or satisfying their curiosity. Learning to learn, managing a learning journey creating a learning biography become first skills.

6. Learning and Knowledge Sharing in Response to the COVID-19 Crisis

In response to the pandemic COVID-19, UNESCO launched a global call to provide education and knowledge partaking through OER [6]. As discussed above, adoption of OER is one of the few available options to successfully achieve SDG4 and quality education for all.

The COVID-19 has led to a paradigm shift in the way learners of all ages acquire learning [5, 7]. Therefore, it is more important than ever for the global society to organize and to promote worldwide access to information and knowledge through OER. The collective action in response to the UNESCO call addresses the encounters of this and coming crises for learners and lays the foundation for the systematic integration of best practices to enhance knowledge sharing in post-crisis potentials of learning [7]. The call encouraged the implementation of the OER Recommendation [5, 25] and also highlighted the important role of the recently launched COVID-19 Global Education Coalition, and the Dynamic OER Coalition [44]. The UNESCO Global Education Coalition, which focuses on the development and deployment of inclusive distance learning solutions, emphasizes the importance of access OER, which is fundamental to ensuring continuity of learning. Therefore, in the spirit of consistent execution of the UNESCO OER Recommendation, the global community was called upon in April 2020 to promote the practice of OER in the open sharing of learning and knowledge worldwide in order to build inclusive, sustainable and resilient knowledge societies.

As local and global inequalities were dramatically exposed during the pandemic COVID-19, OER and open educational practices (OEP) have facilitated practical and equitable approaches to learning, teaching, and assessment in our respective contexts [14, 20, 21, 39, 40]. The pandemic has also moved the adoption of MOOC from the margins to the center of the educational field. According to Coursera [40], the rise and scale of MOOC have been tremendous. It has been estimated that more than 1.6 million learners around the world have benefited from Coursera's partners' contributions to the pandemic.

The pandemic has led to a paradigm shift in the way learners of all ages around the world acquire learning. Therefore, it is more important than ever for the international community to work together to promote global access to materials and realization OER. UNESCO [2, 25] has argued that collective action aims to manage the encounters of this and coming crises for learners, as well as to lay the groundwork for the systematic integration of the best preparations to increase knowledge sharing in the post-crisis period.

It is crucial to prepare workforces for innovative and higher-skilled roles, as competition for skills and talent will intensify in the near future. Employees need to take more personal responsibility for their learning journey and identify themselves as lifelong learners. Labor market demands focus on "just for me" and "just in time learning" as well as microlearning [41]. Education and training institutions need to keep pace with this extraordinary change. Moreover, redesigning curricula, towards curricula 4.0 to meet the demands of society and the 4IR is a major challenge as it involves multi-layered management processes and various organizational hurdles. Many educational organizations are still guided by old-fashioned tactics and discipline-specific "silo approaches," while the novel post-crisis era requires new resilient modes of tactics and creative governance and management.

7. Discussions

Although open education has a long tradition, it gained increasing attention in 2020 as educators responded to the pandemic COVID-19. Its potential benefits are evident in three areas: expanding access to education, improving pedagogy, and promoting equity.

OER can have a notable impact on the SDGs, especially SDG4, in the area of education, based on the pillars of access, equity, equality, quality and inclusion. OER can expand access to lifelong learning opportunities, deliver quality education, and create legal and policy frameworks that support synchronized partnerships, among others. It is widely recognized that OER serves as a game changer and catalyst for lifelong learning and uninterrupted professional development for upskilling, reskilling, and unskilling. Similarly, OER is used as a microlearning in workplaces and vocational training.

International research has shown that the employment of OER and open education at local, regional and national levels has been too relaxed, notwithstanding international proposals since its launch in 2002. Research and experiences worldwide have even shown that the implementation of OER is highly related to policies and tactics, so it
is a matter of organized governance and leadership at all levels, including top, middle and senior managers. Several countries and institutions have tactics to realize OER and/or CC licenses. They have been shown to be better prepared and better equipped for the digital transformation of education because of their underlying ideologies, values, and visions of OER. Therefore, tactics to leverage OER are important catalysts in the transformation of higher education and the digital transformation of education. OER are expressions of successful global academic collaboration in teaching and learning and the ways in which partnership and cooperation can grow. Arguably the most important argument is that what is paid for by taxpayers should be returned to taxpayers to serve global SDG4, including its core tenets of access, equity, equality, inclusion, quality and lifelong learning.

Based on the ICDE Lifelong Learning Summit 2019, a roadmap for lifelong learning was developed. It included actions at three levels, consistent with UNESCO’s OER 2019 Recommendation: (i) government for encouragement structures; (ii) employers and educational leaders for implementation; and (iii) educators for implementation. Stephen Downes emphasized the need to consider the future of OER in relation to broader quality concerns. He argued for the need to refer to concepts such as environment, culture and participation, not just content, and the need to maintain collaborative working.

Both OER and MOOC enable learners and scholars to stay current and relevant in the changing international environment. Similarly, networked people, such as teachers and learners, have constant access to up-to-date knowledge through the use of social media. Through the use of OER and MOOC, learners can access the highest quality and latest assets and research from the global professional community. Through OER, people can retain, reuse, revise, remix, redistribute, and even sell knowledge for commercial purposes. Individuals can contextualize and adapt their knowledge to their learning context and culture without having to "reinvent the wheel". Consequently, people can devote more time and resources to deep learning and reflection. With business models that include both MOOC and OER, the following benefits can be achieved:

- Ongoing qualified growth
- Promotion and branding
- Enrollment of new scholars
- Part of learning resources in ordinary courses
- Learning here and now “just for updating” and “just for me”
- Informal and formal learning, that are progressively merged

- Up-skilling, reskilling and un-skilling

Developing a lifelong learning ethic and culture requires new educational policies and the provision of real opportunities for people to learn throughout their lives, and to orchestrate their own learning. This learning ecosystem fluidly integrates different learning modalities and combines case-based forms of learning, such as formal, non-formal and informal learning. The learning occasions allow for planned or unstructured personal or collaborative learning. In this ecosystem, there is easy access to both campus and online learning opportunities as local organization, global connectivity, and devices available to all. In the lifelong learning paradigm, diversity and multi-faceted learning opportunities are needed at all stages, from the novice to the very sophisticated learner, and at a pace that matches the learner. Another issue is the need to ensure safety standards, which includes learning about risks, safety and rights in the online world, as well as improving health, digital health literacy and well-being.

8. Conclusions

There is an urgent need to create a culture of lifelong learning. Understanding that all levels of learning are learner-centered represents a critical, resilient shift in traditional assumptions about education and needs-based planning. Based on this understanding, learners are operational representatives rather than inactive beneficiaries of prepared information. They themselves actively shape each learning process and its outcomes and use them to maximize their potential to become what they want to become. To effectively support individuals in constructing and shaping their learning profiles, there is a need to recognize authorized and other formal means of recognizing, validating and accrediting learning outcomes achieved in different contexts. This has led to a democratization of negotiation processes and forums aimed at balancing individual and societal learning needs. Moreover, learning needs to be embraced as a shared progress that takes place among colleagues, in different societies and across generations. School accentuates the growth of international inhabitants who are attentive to themselves, to others, to other communities, and to the globe. Consequently, lifelong learning is for anyone and everyone, and learning opportunities should even be created for the most vulnerable and otherwise often ignored learners. A global learning ecosystem should therefore be mutually and equitably fostered to encourage and enable learners by creating a wealth of opportunities for the well-being and achievement of SDG4 and the future of education so that everyone can learn to become what they want to become, to orchestrate their learning and contribute to strong soci-
Cultivating a culture of lifelong learning requires new educational policies and the creation of real opportunities for people to learn throughout their lives. To achieve and cultivate this culture, universities must develop breakthrough business models. The pursuit of sustainability and resilience will be another key feature of universities in 2030. Following the guidance in this chapter, by then universities will have embedded sustainability and resilience as an integral part of their mission in learning, teaching, research, innovation, and culture. To achieve these goals, the civic functions of universities must be brought to the fore. Universities are at the forefront of promoting public debate about respect for evidence-based arguments. Universities need to encourage engagement of their staff, and learners, researchers and other stakeholders and other shareholders need to connect with society at all levels by building bridges with other communities, external partners and citizens, all of whom need to be welcomed as active participants in the activities of the university. Accordingly, universities and the academic community must open their doors to and collaborate with society and the external world.

The social, ethical and moral dimensions of learning and education must be taken seriously because they are a priority in the agenda for social justice and human rights, for well-being and growth in all means. Only in this way can resilient and sustainable education be achieved aligned with human rights and social justice for everyone, in line with the major global initiatives described and discussed in this chapter.

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ARTICLE

A Comparative Study of Humanistic Exchange and Cooperation between China and Southeast Asian in the Perspective of "the Belt and Road" Initiative

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ABSTRACT

In the exchanges between different countries, apart from enhancing political mutual trust and strengthening pragmatic cooperation, it is of great importance to forging humanistic exchange. With a long history of exchanges between China and all the countries in South-east Asia, the humanistic exchange between China and South-east Asia has been continuing since the founding of the People's Republic of China. After the establishment of China-ASEAN dialogue relations, the strategic position of humanistic exchange has been rapidly improved. By means of the case study of Confucius Institute, sister cities, and tourism cooperation, the author has found that humanistic exchange between China and South-east Asia has enjoyed a long history and embodied profound and extensive meaning. It is the ancient Maritime Silk Road that helped to form the exchanges between China and South-east Asia. In the meantime, it is the 21st-Century Maritime Silk Road that has deepened this friendship. The successful experience of humanistic exchange and cooperation between China and South-east Asia has not only consolidated the China-ASEAN strategic partnership but also provided a conducive reference for people-to-people ties in the implementation of the Belt and Road Initiative. In addition, it has added dynamics and confidence to the building of a community with a shared future for mankind which is propelled by China's humanistic diplomacy.

Keywords:
Relationship between China and South-east Asia
Confucius institute
Sister cities
Tourism cooperation
“the Belt and Road” Initiative
Humanistic exchange

1. Introduction

Southeast Asia is located in the southeast of Asia, the Indian Ocean in the west, the Pacific Ocean in the east, Oceania in the south, China and India in the north, and is located in Asia and Oceania, the Pacific Ocean and the Indian Ocean "crossroads ". Because of its superior geographical location, Southeast Asia is of great significance to the implementation of the "Belt and Road" policy in China, and Southeast Asian countries are also the natural partners and priority directions for the construction of the "21st Century Maritime Silk Road " in China.

2. Overview of the History of Humanistic Exchange between China and Southeast Asian Countries

2.1 "Maritime Silk Road" and Humanistic Exchange between Ancient China and Southeast Asian Countries

In history, the development of the Maritime Silk Road...
is divided into four main stages: one is the opening period from the pre-Qing Dynasty to the Han Dynasty; the other is the development period from Wei, Jin to Sui, and Tang dynasties; the third is the prosperity period from Song Dynasty to Yuan Dynasty; and the fourth is the period from the Ming Dynasty to the Qing Dynasty.

After Zhu Di's accession to the throne in 1402, in order to strengthen his contacts with the countries of the Southern Ocean, Zheng He was sent from 1405 to lead the world's most advanced and largest fleet, leading a large number of people and carrying large quantities of goods.

On the political level, compared with the spontaneous formation of the "land Silk Road" to promote trade exchanges and civilized dialogue between China and foreign countries, the "maritime Silk Road" opened by Zheng He's fleet has a clear political purpose, expanding and deepening friendly relations between China and neighboring countries and Asian-African countries along the way, and has become the historical source of China's practice of "peaceful diplomacy" thought. On the economic level, Zheng He's seven voyages to the West to a certain extent led to the development of "tribute trade" between China and foreign countries. Because of the large size of Zheng He's fleet, every time he goes to sea, he will transport goods used for overseas trade and carry out official trade in addition to carrying a large number of reward items. Therefore, the "tribute trade" formed by Zheng He's voyage to the West greatly enriched the scale and types of Sino-foreign trade at that time. On the cultural level, Zheng He's voyage to the West promoted the exchange and spread of Buddhism, Islam, and other religions in Southeast Asia. Although the religious and humanistic exchange was not the main purpose of the Ming Chengzu's dispatch of Zheng He to the Western Ocean, Zheng He himself attached importance to it and even formed "Zheng He belief" and built places of worship in some areas, such as Siam Sanbao Temple, Javanese Sanbao Temple, Da Jue Temple, etc. Zheng He realized the first real and active religion in the history of the country to "go out ".

In addition, Zheng He also played a direct impact on the formulation and implementation of the policy of overseas Chinese in the Ming Dynasty. During Zheng He's voyage to the West, he found that there was a huge difference between the court's cognition and the actual situation of the expatriates. Overseas Chinese not only did not respond to the court's appeal, but also divided into two groups: Chinese Muslim groups mainly from Fujian (especially Quanzhou), Guangdong, Yunnan, and Hainan, and Chinese folk religions mainly from Guangdong and Fujian. On this basis, Zheng He formulated a policy of flexible consideration of the interests of overseas Chinese, set up a special organization responsible for the management of overseas Chinese in Southeast Asia, and cooperated with Zheng he in political and economic support during his voyage to the West, so that the social status and image of overseas Chinese were promoted.

2.2 Humanistic Exchange between China and Southeast Asian Countries between 1949 and 1991

The countries of Southeast Asia are close neighbors of China. As early as 2000 years ago, they began to exchange humanities, have profound influence on each other in religion, art, literature and so on, and have established traditional friendly relations with each other.

After the founding of New China, in Southeast Asia, China first established diplomatic relations with Vietnam, Indonesia, and Myanmar, and began close humanistic exchange. In the 1950s, China and Vietnam signed a cultural cooperation agreement, and mutual humanistic exchange were very frequent. In addition to the exchange of visits by government cultural delegations, writers and professional delegations of fine arts, China sent an art troupe to Vietnam to visit and perform almost every year. During the same period, China's humanistic exchanges with Myanmar, Indonesia, and Cambodia were also quite active. A Chinese cultural delegation headed by Ding Xilin, Deputy Minister of Culture (in the second half of 1951), a large Chinese art troupe led by Zheng Zhenduo, Deputy Minister of Culture (in January 1955, performing songs, dances, and Peking Opera) and many cultural and friendly people visited Myanmar. Chinese culture, writers, Buddhist delegations and art groups visited Indonesia and Cambodia, and similar delegations from these countries visited China one after another. During this period, China and Thailand, which has not yet established diplomatic relations, also began folk humanistic exchange.

In the 1960s, China signed cultural agreements with Indonesia and Cambodia, and its humanistic exchange projects increased. From 1961 to 1965, there were 9 delegations from Indonesia to China, including films and friends associations, and 4 from similar delegations from China to Indonesia. From 1960 to 1967, four Chinese art groups visited Cambodia. At the same time, Cambodian art troupes also visited China many times. But after the beginning of the Cultural Revolution, China's humanistic exchange with Southeast Asian countries basically stopped, and humanistic exchanges with Indonesia were interrupted.

In the mid-1970s, China resumed humanistic exchange with most countries in Southeast Asia. In the late 1970s,
China had close cultural contacts with the Philippines and Thailand, and signed a cultural agreement with the Philippines in 1979. In addition, from 1975 to 1979, China visited Singapore, where diplomatic relations had not yet been established, and Malaysia, where humanistic exchanges were less frequent. China suspended cultural relations with Cambodia and Vietnam due to the change of political situation in Cambodia in 1970 and other well-known reasons.

From 1980 to 1991, China entered a new stage of humanistic exchange with Southeast Asian countries, and signed an annual cultural cooperation implementation plan with most of them. The projects exchanged between the two sides were not only wide in scope, but also increased in number and specifications. During this period, government cultural delegations led by Minister of Culture Huang Zhen, Zhu Muzhi, Wang Meng, acting Minister he Jingzhi, Vice Minister Yao Zhongming, Lu Zhiguang and Liu Deyou visited Thailand five times, the Philippines and Myanmar three times each, and also visited Malaysia, Singapore and Laos. China sent to the Philippines to visit more than 10 art troupes, Thailand, Singapore art troupes each 20. In the same period, government cultural delegations and art troupes led by the ministers of culture of most Southeast Asian countries also visited China many times. As for the exchange of visits of writers and films, radio and television, news, education, sports and other delegations are numerous. In addition, a number of film festivals and art exhibitions have been held with most countries in South-East Asia. Over the years, through a variety of humanistic exchange, China and Southeast Asian countries to enhance friendship and mutual understanding.

### 2.3 Humanities Exchange after China and ASEAN Establish Dialogue Relations

China and ASEAN established a dialogue relationship in 1991 and signed the Joint Declaration of the People's Republic of China and ASEAN Leaders in 2003 and announced the establishment of a "strategic partnership for peace and prosperity ",[1] In the early 21st century, multilateral cooperation on the platform of international organizations has become a new focus of our diplomatic work. The strategic partnership between China and ASEAN for peace and prosperity is an important diplomatic practice under this background. In order to clarify the specific content of the cooperation, in 2003, the two sides signed the Action Plan for the Implementation of the Joint Declaration of China-ASEAN Strategic Partnership for Peace and Prosperity (2005-2010). In the next 10 years, To continue to deepen China-ASEAN strategic partner-

ship for peace and prosperity, Supporting ASEAN as an ASEAN community in 2015, The two sides signed the Action Plan for the Implementation of the Joint Declaration on China-ASEAN Strategic Partnership for Peace and Prosperity (2011-2015); To promote a peaceful, stable, integrated, prosperous and caring ASEAN community, The two sides signed the Action Plan for the Implementation of the Joint Declaration of China-ASEAN Strategic Partnership for Peace and Prosperity (2016-2020). The main areas involved in human exchanges include: scientific and technological cooperation, cultural cooperation, educational cooperation, local government cooperation and folk exchanges.

Since the establishment of China-ASEAN dialogue relations, the two sides have created a series of cooperation platforms, such as the China-ASEAN Exposition, the China-ASEAN Center, the China-ASEAN Environmental Protection Center, and the China-ASEAN Education Exchange week. Cooperation mechanisms have been established in about 11 fields, close human exchanges and cooperation have strengthened the foundation of bilateral friendship and brought tangible benefits to the people of both sides.[2] Over the past 28 years, China and ASEAN have carried out multi-level and multi-channel humanistic exchange and cooperation through ministerial meetings, forum discussions, personnel exchanges, art festivals and exhibitions, which have greatly enhanced the understanding, respect and appreciation of each other's cultures by China and ASEAN and laid a solid foundation for the development of China-ASEAN relations.[3] Since 2005, China and ASEAN have identified culture as a key area of cooperation. In recent years, from the office to the folk, China and ASEAN have cooperated frequently in the cultural industry, festival and exhibition, language education and training, tourism, sports, performing arts and so on, and the field of humanistic exchange has been expanding. [4]

In addition, China and ASEAN countries have conducted multi-level and multi-field exchanges and discussions to enhance mutual understanding. The year 2016 marks the 25th anniversary of China-ASEAN dialogue and the year of educational exchange. The two sides have launched a series of activities to promote youth exchanges and development, including the ASEAN Student Games, the Youth Humanities Forum, the Youth Leaders Summit in Colleges and Universities, and youth summer camps. Building on China-ASEAN youth exchange activities, support for ASEAN student activities, exchange activities between China-ASEAN vocational education institutions, China-ASEAN Education Exchange Week and cooperation projects organized by Southeast Asian Ministers of
Education, China-ASEAN Language and Culture Center, Chinese Language and Culture Education Base, Education and Research Network and Association for Cooperation and Exchange of Engineering Universities have been set up one after another. [5]

In general, China established stable ties with Southeast Asian countries through land and sea trade during the Han Dynasty. With the development of navigation technology, Zheng He, a navigator of the Ming Dynasty, built a far-reaching maritime trade network between China and Southeast Asian countries. Economic and trade cooperation opened a new chapter, and population mobility reached a peak in this period. Since the founding of New China, China and Southeast Asian countries have been increasingly close in humanistic exchange. In all kinds of documents signed, the importance of humanistic exchange has gradually increased, especially in the field of education cooperation has established a close cooperative relationship.

3. Comparison of China's Major Projects on Human Exchange in Southeast Asia

3.1 Education Exchange —— Confucius Institute

Confucius Institute, Confucius classroom is a non-profit educational institution established in our country in cooperation with foreign universities, middle schools and other educational organizations. It is a new educational model. With the increasing political, economic and cultural strength of China, Confucius Institute, as a Chinese language and Chinese culture promotion organization, has received more and more attention. Since the establishment of the first Confucius Institute in Seoul, South Korea in 2004, as of June 2019, 539 Confucius Institutes and 1129 Confucius classrooms have been established worldwide, covering 155 countries and regions in Asia, the Americas, Europe, Africa and Oceania. [6]

Southeast Asia has a special geographical location. The 11 countries in Southeast Asia are connected by land with our country by Myanmar, Laos, Vietnam, Thailand and so on. The countries connected by sea with our country are Philippines, Malaysia, Indonesia, Brunei and so on. These countries have a deep relationship with China, have lasted for thousands of years in economic, trade and humanistic exchange, and Southeast Asia is the most Chinese and overseas Chinese region in the world. However, according to the official figures released by the National Han Office, the number of Confucius Institutes and Confucius classrooms in Southeast Asia is relatively small and uneven compared with Europe, America and East Asia. (See Figure 1)

3.2 Cultural Exchange —— Confucius Class

As of June 2019, Of the 11 countries in South-East Asia, With the exception of Brunei and East Timor, which did not have Confucius Institutes (classrooms), Other countries have established 37 Confucius Institutes and 17 Confucius classrooms (including those to be launched). (See Figure 2) Quantitatively, Thailand has the largest number of Confucius Institutes, Confucius Class (11), Indonesia ranks second, third in the Philippines, Malaysia fourth, Laos, Cambodia, Singapore, Vietnam one each.

3.3 Economic and Trade Exchange —— Confucius Class (1)

As of December 31, 2018, January 2006 to December 2018, in 13 years, 34 Confucius Institutes were established in Southeast Asia, 11 in 2006, No new Confucius Institutes have been established in Singapore, Cambodia and Laos since 2010; No new Confucius Institutes were established in Southeast Asia between 2011 and 2013. (See Figure 3) [7]
From the historical and cultural point of view. During the Han Dynasty, China established stable ties with Southeast Asian countries through land and sea trade. During the prosperous Tang Dynasty, the two sides exchanged more frequently. With the development of navigation technology, Zheng He, a navigator of the Ming Dynasty, built a far-reaching maritime trade network between China and Southeast Asian countries. Economic and trade cooperation opened a new chapter, and population mobility reached a peak in this period. Economic and trade exchanges have led to population mobility and cultural transmission — the influence of Han culture on Southeast Asian countries, the spread of Buddhism in China, and so on.

From the perspective of geographical nationality. Most of the overseas Chinese in Southeast Asia moved from Fujian, Guangdong, Hainan and Zhejiang in the early years. In addition, among the Southeast Asian countries bordering China, the same ethnic groups have different names: the Kachin people of Myanmar and the Jingpo people of Yunnan, the Thai people of Thailand and the Dai people of Yunnan, etc. These groups have the same customs and cultural background, have a strong sense of identity and innate affinity to the Han culture, and support the establishment of Confucius Institutes.

From a religious background. Thai people mostly believe in Buddhism; Indonesia, Malaysia, Brunei people mostly believe in Islam, and the Philippines is a Catholic country. The teachings of various religions are different, relatively speaking, Buddhism is more open and inclusive, the acceptance of various cultures is wider, and Buddhism has a long history of its introduction into China. Confucius Institutes carry out the spread of Chinese culture in Buddhist countries more easily accepted.

From the state support, Thailand is Southeast Asia to support the establishment of Confucius Institutes the largest country. Princess Sirindhorn, a member of Thailand’s royal family, actively promoted humanistic exchange between China and Thailand. The royal family, which has a good public foundation and is respected by the Thai people, played a good role in promoting and promoting the guidance of national policies, which led to the rapid development of Confucius Institutes in Thailand. In 2006, the Chinese Affairs Office of China and the Ministry of Education of Thailand signed the Framework Agreement on Sino-Thai Chinese Teaching Cooperation. In the same year, Thailand established 10 Confucius Institutes, and the teaching of Chinese in Thailand changed rapidly from a form of civil organization to cooperation between the Chinese and Thai governments. Cultural identity, homology and national acceptance all have an impact on the distribution and number of Confucius Institutes, but the influencing factors are comprehensive, and it cannot be considered that a single factor has a significant impact on them.

3.2 Conclusion of Friendly City Relations

Because of China’s proximity to Southeast Asian countries, both sides are rich in tourism resources, humanistic exchange have a long history, Coupled with the fact that early immigrants mostly moved to Southeast Asian countries, Therefore, Chinese cities and Southeast Asian countries naturally concluded friendly urban relations. According to statistics from the China Friendship Cities Federation, As of September 2019, China and the 11 nations of Southeast Asia have established 202 friendly cities, Thailand 40, Vietnam 38, Philippines 30, Indonesia 27, Cambodia 24, Laos 17, Malaysia 15, Myanmar 8, Brunei, Timor-Leste and Singapore, And China has established friendly city relations with Hanoi, Thailand, Manila, Indonesia, Phnom Penh, Vientiane, Myanmar, Rangoon, and Bandar Seri Begawan. The development of friendly urban relations between China and Southeast Asian countries, on the one hand, mainly serves the economic cooperation and the opening of tourism resources between the two places. On the other hand, the two places are more abundant than the types of friendly cities between China and other regions because of their long history of humanistic exchange, religious beliefs and ancestral origin. It can be divided into political, historical, geographical, kinship and religion.

From a political point of view, some cities have important political and economic status in their respective countries, thus concluding friendly city relations. This category is first and foremost the friendly city relations established between the two capitals, such as Beijing, China, which has established friendly relations with the Indonesian capital Jakarta Special Zone, Bangkok, Hanoi, Manila, the Philippines and Vientiane, the Lao capital. In addition to the capitals of various countries, some central cities and important provinces and regions of China have also established friendly city relations with the central cities of other countries, such as Shanghai, Guangdong and Guangxi Zhuang Autonomous regions, which have successively established friendly city relations with Ho Chi Minh City, Vietnam.

Geographically, China has land borders with Vietnam, Laos and Myanmar in Southeast Asian countries, and the economic ties, personnel exchanges and the establishment of friendly cities on the land border between the two sides often play a mutually reinforcing role. The Guangxi Zhuang Autonomous Region has a land border with
Vietnam, while Yunnan Province has a land border with Vietnam, Laos and Myanmar. Nine pairs of friendly cities have been concluded between the border cities of Guangxi Zhuang Autonomous region and Vietnam, four pairs of friendly cities have been established in the border cities of Yunnan Province and Vietnam, and two pairs of friendly cities have been established in the border cities of Yunnan Province and Laos. Yunnan Province and Myanmar border cities concluded two pairs of friendly cities.

Historically, on 2 June 2016, Fuzhou City, Fujian Province and Indonesia Sanbao Ridge City to form a friendly city. The conclusion of friendly city relations between the two cities is related to the navigation of Chinese navigator Zheng He. When Zheng He first went west, landed and traded on 30 June 1406 in Sanbao Ridge, Java. Sanbao Ridge City is also named for this. Changle City, a subsidiary of Fuzhou City, is the anchor of Zheng He's voyage to the West. Zheng He was in the Ming Dynasty Xuande six years (AD 1431) in the territory of Changle Tianfei Palace set up "Tianfei Ling Ying Ji" tablet, to record the purpose and significance of the voyage. The first six Western passes, achievements and the seventh Western mission. Zheng He's great voyage to the West, So that Zheng He in Fuzhou, Fujian Province, Changle City and including Indonesia, Malaysia and other Southeast Asian countries by the local people as gods, and thus formed the "Zheng He belief ". Sanbao Ridge is the third largest port in Indonesia. There are two temples commemorating Zheng He, namely," Sanbao Palace "and" Da Jue Temple ". Every year on June 29(or 30) of the lunar calendar, Sanbao is the day of inspection (some people call it Sanbao birthday). On this day, people carried the statue of Zheng He parade, symbolizing Zheng He out of the cave patrol. After Fuzhou became an important node city of the Maritime Silk Road in the 21st century, in August 2014, the Fujian Provincial delegation held economic and trade tourism promotion and business reception and cultural performances in Sanbao Ridge, Indonesia, to deepen economic and trade and humanistic exchange between the two places. In terms of kinship, the city is the most friendly city in Malaysia and China. It is also the most concentrated area of overseas Chinese in Fuzhou, about 80% of the local overseas Chinese, and about 70,000 Chinese and overseas Chinese from Gutian and Pingnan in Ningde City gathered in Shi Wu. Locals speak Fuzhou (Minqing). Among the merchants in the city, 90% are Chinese (mainly descendants of Fuzhou Minqing and Gutian). These factors make up the psychological situation of the Chinese, so that they recognized their mother tongue (Fuzhou) and Mandarin in language and literature, Formed a unique cultural foundation. Qinghe County, Hebei Province is considered the origin of the Zhang clan, the overseas population of Zhang is over 20 million, Malaysia is the majority of Shiwu City. "There are now more than 40,000 overseas Chinese of Guangning nationality in Shiwu City, Is the overseas Guangning Chinese overseas Chinese most concentrated area, With the Malaysian Shiwu Guangning Association in the city of Shiwu, And the original mayor of Shiwu City award of the ancestors of the Han Dynasty is also Guangning County, Driven by the Canton Ning guild, The two cities were able to establish friendly urban relations. "

In religion, Buddhist culture has become an important factor in promoting the establishment of friendly relations between China and Southeast Asian cities. In addition to the cities of Yun and Gui provinces, the only friendly city relationship between Myanmar and other provinces in China is Yangon and Yangzhou City, Jiangsu Province. The friendly city relationship between the two cities is due to the Buddhist culture of the two places. Yangzhou is an important area for the development and spread of Chinese Buddhism. In July 1995, Yangon City Mayor Angkor Li led a delegation to visit Yangzhou, visit Daming Temple, learned that the new Qiling Tower to invite jade Buddha worship, immediately said to give five jade Buddha. Jade Buddha arrived at Daming Temple from Shanghai Port on April 29,1996, and then Yangzhou and Myanmar established friendly city relations on July 8,1997.

Based on the above several aspects, although China and Southeast Asian countries concluded friendly urban relations late, but the prospects are considerable, but also because of geopolitical, economic cooperation space, rich tourism resources and a long history of humanistic exchange and other factors and rapid development. As far as the current development is concerned, the overall power gap between China and Southeast Asian countries is widening, and under the combined influence of non-traditional security disputes such as the overseas Chinese issue, the South China Sea territorial dispute, the exploitation of resources, and the "China Threat Theory ", the negative factors of cooperation between the two sides are expanding. ASEAN countries are concerned that they are at a disadvantage in their relations with China, that doubts and guard against China still exist or even strengthen, that differences are magnified, and that cooperation in political security is affected.

3.3 Rich Tourism Resources

Tourism is an activity between tourist destination and tourist destination through tourist passage. According to the characteristics of modern transportation, it is directly manifested as the flow of tourists between cities and the convenience of inter-city communication. In cross-border
At present, Mazu culture has been spread and developed among the believers, overseas Chinese are an important part. There are differences in development level, social system, ideology, culture and religion between China and Southeast Asian countries, which brings surprises to the tourism industry income of these countries every year. Among Southeast Asian countries, Malaysia, Singapore, the Philippines and Thailand are more representative.

Based on the above analysis, we can travel is an indispensable part of the construction of the "21st Century Maritime Silk Road ", is a "people's hearts and minds" project, in the "Belt and Road" interconnection has the advantage of connecting first and first.

4. Thoughts on Further Deepening the Humanistic Exchange between China and Southeast Asia

In a speech to Indonesia’s parliament in October 2013, President Xi Jinping pointed out that China-ASEAN relations are at a new historical starting point and that China is willing to work together with ASEAN countries to make the two sides “good neighbors, good friends and good partners ”, to build a closer “China-ASEAN destiny community” and to jointly build the "Maritime Silk Road" in the 21st century. Especially under the background of the deterioration of China’s surrounding environment, activating the common memory of China and Southeast Asian countries through Zheng he’s voyage to the West and reshaping the friendly relations between China and Southeast Asian countries by the "Maritime Silk Road" in the 21st century will become an important way for both sides to communicate values and deepen mutual trust and cooperation. In 2011, the China-ASEAN Center was formally established as an important service platform to promote exchanges and cooperation in economic, trade, education, tourism and culture. China is willing to further strengthen social and humanistic exchange with ASEAN, jointly promote exchanges in the fields of tourism, education, culture, media and youth, and make use of the China-ASEAN Center, Education Exchange Week, Youth Camp and other platforms to continuously enhance folk understanding and friendship, so that the people of both sides can become firm supporters, active builders and real beneficiaries of China-ASEAN relations.

In a word, in China’s exchanges with Southeast Asian countries, a word "harmony" runs through all the time, which not only contains the feat of Zheng he’s seven voyages to the West and the opening up of the "Maritime Silk Road ", but also reflects the objective facts of harmony and symbiosis between the two sides for thousands of years. There are differences in development level, social system, ideology, culture and religion between China and

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**Figure 4.** Chinese mainland Number of visitors to ASEAN countries (2007-2016) [13]

China and ASEAN are important tourist destinations and tourist destinations, and China is the largest foreign tourist destination in ASEAN. Tourism cooperation in 2017 has become a key area of China-ASEAN cooperation. In March 2017, China and ASEAN officially launched the "China-ASEAN Tourism Cooperation Year ". Around tourism cooperation, China and ASEAN have launched a series of exchanges and cooperation. In addition, tourism facilitation services are also in full swing, Asian airlines and other airlines have increased routes for China and ASEAN countries, and countries such as the Philippines have introduced visa facilitation and preferential policies for Chinese tourists. The number of Chinese tourists traveling to ASEAN countries has further increased. In terms of inbound tourism, Myanmar, Vietnam, Malaysia and the Philippines of ASEAN countries entered the top ten tourist countries in the 2017 Chinese foreign inbound tourism market. [14]

In addition to rich natural resources, superior geographical location and government policy support, tourism in Southeast Asia is greatly influenced by religious culture, among which the representative is Mazu culture.

Mazu culture is one of the most recognized cultures of overseas Chinese. According to relevant statistics, Mazu has more than 300 million believers in the world. Among the believers, overseas Chinese are an important part. [15]

At present, Mazu culture has been spread and developed in many overseas countries, and occupies an irreplaceable position in the tourism industry of some Southeast Asian countries, which brings surprises to the tourism industry income of these countries every year. Among Southeast Asian countries, Malaysia, Singapore, the Philippines and Thailand are more representative.

---

**Figure 4.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,256,392</td>
</tr>
<tr>
<td>2008</td>
<td>1,473,493</td>
</tr>
<tr>
<td>2009</td>
<td>1,412,882</td>
</tr>
<tr>
<td>2010</td>
<td>1,312,601</td>
</tr>
<tr>
<td>2011</td>
<td>2,962,311</td>
</tr>
<tr>
<td>2012</td>
<td>12,551,154</td>
</tr>
<tr>
<td>2013</td>
<td>18,596,288</td>
</tr>
<tr>
<td>2014</td>
<td>20,339,261</td>
</tr>
<tr>
<td>2015</td>
<td>21,741,001</td>
</tr>
<tr>
<td>2016</td>
<td>22,059,472</td>
</tr>
</tbody>
</table>

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Southeast Asian countries, with outstanding diversity, but we have geographical advantages, historical, cultural and even blood advantages. We should make use of these resource advantages, seize the opportunity, and jointly construct a new pattern of humanistic exchange between the two sides.

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**Author's Brief Introduction**

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ARTICLE

A View of Beijing’s Traffic Policy: Evaluation on the Policies Released in 2010 to Ease Traffic Congestion

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1. Introduction

1.1 About the Policy

In order to solve the problem of traffic congestion, in December 2010, The Beijing Municipal People’s Government issued work opinions on further promoting the scientific development of the capital’s transportation and intensifying efforts to alleviate traffic congestion, and introduced a series of policy measures, such as the implementation of traffic restrictions, the implementation of lottery purchase restrictions proposed for the first time in the whole country, the increased parking fees in central urban areas and so on.

1.2 Purpose of the Report and the Methodology

In this report, comparative analysis of specific data in several aspects, including changes in the congestion index of key road sections before and after the implementation of the Beijing policy, changes in car ownership, changes in the number of public parking lots and parking spaces, and changes in the structure of residents’ travel mode will be conducted. This report will adopt comparative data analysis method to analyze and evaluate the effectiveness of the policy measures released by the government in 2010 and provide constructive suggestions on Beijing traffic congestion.

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2. Background of the Policy

2.1 History of the Policy Intervention

Before the promulgation of the traffic opinions in 2010, Beijing also issued other related policies. After 2000, the Beijing Municipal Government was committed to fully realize the strategic vision of “New Beijing, New Olympics”. In order to build a modern international city with distinctive characteristics, a famous cultural city and a livable city, the government had done a lot optimizing its road infrastructure.

In 2007, the Beijing Municipal Party Committee and Municipal Government decided to compile the “Beijing Transportation Development Outline (2004-2020)”, with the goal of initially establishing a national road transportation network by 2010, optimize city roads, track systems, urban road systems, bicycle and pedestrian paths. Nevertheless, even with all the efforts, the problem of traffic congestion in Beijing was still serious.

For this reason, the Beijing Municipal Government has decided to introduce more effective measures and plans to promulgate the “Beijing’s Opinions on Further Promoting the Scientific Development of the Capital’s Transportation and Strengthening the Work to Alleviate Traffic Congestion.” The Beijing Municipal Government launched a week-long solicitation of opinions. A total of 2,929 suggestions were received online, of which 94.2% offered constructive opinions and 5.8% opposed. After careful research and absorbing many valuable suggestions from citizens, this policy was promulgated on December 24, 2010.

2.2 Problems It Seeks to Address

The policy measures issued in 2010 are to solve a series of traffic problems in Beijing. For example, the functions of the central city and the high concentration of the population, the high-speed growth and high-intensity use of the number of motor vehicles, the insufficient attractiveness of public transportation, and the incompatibility of the comprehensive management level of the transportation with the excessively rapid growth of the number of motor vehicles. In response to these problems, the opinions on alleviating traffic congestion set the following goals. First, it is necessary to ensure that the traffic conditions in the central cities, especially the core areas, do not deteriorate, and it is possible to improve the traffic conditions on the main road sections to facilitate citizens’ travel and ensure that the country provides strong traffic protection. Second, it is necessary to increase the proportion of residents traveling by public transportation. Significantly increase the proportion of public transportation in central cities, maintain the proportion of bicycle trips, and control the proportion of car trips. Third, reduce the emission of major pollutants from motor vehicles. Fourth, improve the level of road traffic safety and ensure the traffic safety of Beijing is at a leading level in China.

2.3 Policy Instruments Adopted

In order to achieve the above policy goals, various policies promulgated in 2010 adopted common government policy instruments, such as formulating traffic rules, charging road fees, increasing investment in road construction, increasing publicity of the environmentally-friendly travel mode. [1]

First, regarding the control of the number of motor vehicles, Beijing has implemented the policy for car purchase and taken measures to control the number of passenger cars. In accordance with the principles of openness, fairness and justice, to eligible enterprises, institutions, social organizations, legal persons and individuals, the allocation of passenger car allocation indicators will be free of charge by lottery.

Secondly, by issuing prohibitions, Beijing has also made a series of regulations to improve public transportation conditions, such as choosing to continue to implement and improve the rush hour regional traffic management measures. And continue to implement regional restrictions on motor vehicles during peak hours and regulations on yellow-label vehicles. In case of severe weather, major events, important festivals, etc., which may cause serious traffic congestion, take measures to drive motor vehicles on single and even numbers during peak hours on key traffic congestion sections.

In addition, users charges are adjusted: (1) Tolls are adopted to regulate public transportation, and the parking charging standards are reasonably adjusted. For example, the key areas within and outside the Third Ring Road are Class I areas, the areas within the Fifth Ring Road excluding Class I areas are Class II areas, and the areas outside the Fifth Ring Road are Class III areas, with parking on the roadside and open air outside the road. The parking price of parking and parking buildings (garages) is tiered, and the principle of charging prices for residential areas and night parking remains unchanged. (2) Formulate key congestion road sections or regional traffic congestion charging schemes, and implement them when appropriate.

At the same time, Beijing has also increased its funding to build a new generation of intelligent traffic management systems, improving the level of intelligent management. The construction funds for road traffic safety facilities and scientific and technological equipment of the whole city.
shall be borne by the municipal finance.

In addition, the government has increased its publicity efforts to the citizens and advocated low-carbon and environmentally-friendly travel through various media, such as the televisions and schools.

3. Methodology

3.1 The evaluation Design

In order to evaluate whether the policies introduced in 2010 effectively solve the problem of traffic congestion in Beijing, we selected different policy evaluation indicators to measure whether the number of private cars in Beijing is under control and whether public transportation has improved. These indicators are: changes in the congestion index of key road sections in a specific period before and after the implementation of the policy, changes in the number of road kilometers and bridges in Beijing after the policy is promulgated, changes in the number of public transportation lines, changes in the number of public parking lots and parking spaces Changes in the proportion of travel mode structure.

3.2 Data Sources

All our research data come from official government websites, such as Beijing Municipal Commission of Communications, Beijing Municipal Commission of Transportation Administration, Beijing Institute of Communications Development, and National Statistical Yearbook. After collecting various data in the years before and after the Beijing 2010 policy was promulgated, the data was re-edited using EXCEL spreadsheet software to form various charts.

3.3 Statistical Methods

The ultimate goal of data analysis is to evaluate the actual situation or the effectiveness of policy implementation. We use the simple before-after comparison method as the method of data statistics. Dynamic comparison refers to the comparison of index values in different periods under the same overall conditions, also called longitudinal comparison. We use this method to compare the differences in traffic data before and after the Beijing 2010 policy was issued to determine whether traffic congestion and car ownership have improved, and whether the policies that have been issued are effective. Specifically, by analyzing data such as personal car ownership, traffic congestion index, changes in the structure of transportation modes, changes in the number of highway bridges and road construction around 2010, it can be concluded whether this policy is implemented and whether it is to a certain extent controlled car ownership or improved traffic.

4. Research Results

4.1 Increasing Public Transport Lines

By searching for the Yearbook of Beijing in 2019, looking for the work of Beijing in road construction planning since 2005, this part analyzes the government’s efforts to increase the number of road kilometers, bridges and public transport lines in Beijing and make some efforts to solve the problem of insufficient attractions of public transport for the citizens.
the scientific development of traffic in the capital and intensifying efforts to alleviate traffic congestion” issued in 2010 is being implemented. However, the resident population of Beijing is also increasing year by year, so it is impossible to determine whether the efforts of increasing road kilometers have effectively alleviated traffic congestion. As we all know, the development of public transport operation lines can not only make residents travel more convenient, but also reduce the number of times of people use private cars to travel, so as to reduce the occurrence of traffic congestion. Comparing the data of 2010 and 2018 in Table 2, we can find that these three data have increased significantly, indicating that the documents issued by Beijing in 2010 have been implemented.

4.2 The Number of the Parking Lots

By searching for the official website data of Beijing Municipal Transportation Committee, this paper finds out that the changes in the number of public parking lots and parking spaces in Beijing since 2009, 2010 and 2017, and then verifies whether this measure has achieved certain effects by using the Beijing traffic congestion index since 2010.

An important solution to alleviate traffic congestion is to provide sufficient parking spaces to reduce traffic congestion caused by disorderly parking the motor vehicles, and finally achieve the policy goal of reducing traffic congestion. We will analyze the data of parking lots and parking spaces in Beijing in 2010 and 2018 to prove that providing sufficient parking spaces can effectively alleviate traffic congestion.

Compared with the number of parking lots and parking spaces, the number of parking lots and parking spaces in Beijing in 2017 increased significantly compared with that in 2010. In terms of the number of parking spaces and lots, residential areas are the largest number of parking lots and parking spaces in Beijing, and they showed an increasing trend. However, the parking lots and parking spaces under the landside road and overpass are decreasing. It is not difficult to understand that if the driver does not park the car correctly, it will make it difficult for other drivers to pass the land side road and overpass, which is extremely easy to cause traffic congestion.

From the chart of Beijing road congestion index, we can see that the road congestion index in 2018 has decreased compared with the 2010 road congestion index. Therefore, increasing the number of car park and the number of parking spaces and increasing public transport lines will play a positive role in reducing traffic congestion.

4.3 The Structure of Travel Mode

4.3.1 Proportion of Residents’ Travel Mode Structure

The proportion of public transportation used by residents in transportation is an important basis for measuring the policy factor of increasing the proportion of public transportation trips. Public transportation is an important foundation for the overall environment of Beijing. Prioritizing the development of public transportation is an inevitable requirement for the continuous development of population and economy. Reducing the total number of vehicles in the central area of the city and increasing the capacity of individual public transport participants are important measures to improve the efficiency of Beijing’s transportation resource utilization and alleviate traffic congestion.

According to the annual traffic report and the classification rules of the main means of transportation, we divide the residents’ transportation modes into six categories: cars, buses, subways, taxis, bicycles and others for data collection, processing, and display discussions.
We found the annual reports of Beijing’s transportation development through the official website of Beijing Transportation Development Institute. Under the topic of residents’ travel characteristics, search for data on residents’ travel patterns during the eight years from 2006 to 2014, manually input the data into Excel, and display the processed data results with a percentage stacked column chart (Chart 5). We adopt the Simple before-after comparison method to compare the transportation modes of Beijing residents before and after the implementation of the policy (from 2006 to 2014) to judge the policy factor of increasing the proportion of public transportation.

On the other hand, the subway, a public transportation vehicle, accounted for an increase of 13.6% in the eight years from 2006 to 2014. Although it is not the largest of the six types of transportation, it is becoming more and more important. To implement the policy goals, we have made great efforts on the subway track tools. From the data, the implementation of the policy goal of increasing the proportion of public transport trips is still relatively effective.

### 4.3.2 Track Construction

Public transportation and subway are two important types of public transportation. Compared with public transportation, subway has greater advantages. Taking the subway is not only faster, more comfortable, safe, green and environmentally friendly, but also saves land. More importantly, the subway does not occupy ground roads, which can alleviate traffic congestion to a greater extent. It has a larger carrying capacity and can transport more passengers one way. In first-tier cities such as Beijing, subways play a greater role in public transportation than buses. Therefore, we conduct data collection and research on the construction and investment of subway tracks. The rail transit network mainly includes five indicators: rail transit operating vehicles, number of operating lines, operating line length, mileage, and annual passenger volume.

Through the official website of the Transportation Management Bureau of the Beijing Municipal Commission of Transportation, we found the data corresponding to the operation indicators of the subway rail transit network from 2007 to 2013, and made the data into a table (Table 1) and a line chart (Figure 6) to analyze and determine the policy After implementation, whether the policy goal of increasing the proportion of public transport trips has been effectively achieved.

**Table 1. Comparison of operation indicators of Beijing rail transit network from 2007 to 2013**

<table>
<thead>
<tr>
<th>Index</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail transit operating vehicles</td>
<td>1130</td>
<td>1714</td>
<td>2014</td>
<td>2463</td>
<td>2850</td>
<td>3685</td>
<td>3998</td>
</tr>
<tr>
<td>Number of operating lines</td>
<td>5</td>
<td>8</td>
<td>9</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>Operating line length (km)</td>
<td>142</td>
<td>200</td>
<td>228</td>
<td>336</td>
<td>372</td>
<td>442</td>
<td>465</td>
</tr>
<tr>
<td>Driving mileage (ten thousand vehicle kilometers)</td>
<td>—</td>
<td>—</td>
<td>18491</td>
<td>21159</td>
<td>28488</td>
<td>31909</td>
<td>45688</td>
</tr>
</tbody>
</table>

**Data source:** Beijing Municipal Transportation Administration Bureau

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Data source: Beijing Transportation Development Research Institute

From the stacked histogram of the percentage of residents’ transportation modes in Beijing from 2006 to 2014, we found that cars accounted for the largest proportion of Beijing residents’ transportation trips. Although the overall decline has occurred, the proportion is very small, only 0.1%. The data show that the largest decline was from 2010 to 2011. The results may be more obvious due to private car restrictions such as lottery and traffic restrictions, but the decline was not large in the later period and still accounted for the largest proportion.

At the same time, with urban population growth and economic growth, the proportion of using bicycles to go out is getting smaller and smaller, which also shows the inconvenience of bicycles as a daily transportation tool in Beijing. Among the key public transportation in this section, subways and buses are the two main forms of public transportation. According to the data of Beijing Transportation Development Research Institute, we found that although the total number of people who choose public transportation to travel has increased, overall shows an upward trend, but the fluctuations are not large and the growth rate is small. And in 2007, 27.5% of Beijing residents chose public transport as their mode of transportation, while in 2013, it accounted for only 25.4%.
4.3.3 Traffic Congestion Index

By analyzing the changes of the congestion index of key sections, the measures in 2010 basically achieved the policy objectives of ensuring the traffic condition of the core area does not deteriorate and improving the traffic condition of major sections. Traffic congestion refers to the phenomenon that the speed and efficiency of motor vehicles on the road network are reduced due to the contradiction between supply and demand of traffic volume, or due to the influence of weather, construction, traffic events, traffic control and other factors. Road congestion generally has the following three manifestations:

1. Low speed vehicles or frequent stops on various parts of highways, such as urban expressways with speeds of less than 40 km / h, main roads and secondary roads with speeds of less than 25 km / h;
2. In the usual running phase, the vehicle is unable to move forward for more than 5 minutes after queuing in place;
3. Vehicles wait for three green lights at an intersection operated by signals but fail to pass, pedestrians and cyclists wait for two green lights but fail to pass.

The evaluation Index system of road Traffic operation in Beijing, adopted when average travel speed as the Traffic running status hierarchy Index (Table 2), and adopted the congestion Index (also called Traffic Index, Traffic Performance Index TPI) as a comprehensive Index reflecting road network flow or congestion degree of conceptual, daily Traffic congestion Index classification as shown in Table 3.

Table 2. Traffic operation grade division based on average travel speed of section

<table>
<thead>
<tr>
<th>Traffic operational level</th>
<th>Blocked</th>
<th>Basically unblocked</th>
<th>Light congestion</th>
<th>Moderate congestion</th>
<th>Severe congestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expressway</td>
<td>V&gt;65</td>
<td>50&gt;V≤65</td>
<td>35&gt;V≤50</td>
<td>20&gt;V≤35</td>
<td>V≤20</td>
</tr>
<tr>
<td>Arterial road</td>
<td>V&gt;40</td>
<td>50&gt;V≤65</td>
<td>20&gt;V≤30</td>
<td>15&gt;V≤20</td>
<td>V≤15</td>
</tr>
<tr>
<td>Secondary road, branch road</td>
<td>V&gt;35</td>
<td>50&gt;V≤65</td>
<td>15&gt;V≤25</td>
<td>10&gt;V≤15</td>
<td>V≤10</td>
</tr>
</tbody>
</table>

Note: V represents the average shape travel speed of section (km/h)

Data source: Beijing Municipal Transportation Administration Bureau

Data source: Beijing Institute of Transportation Development

Table 3. Analysis of daily traffic congestion index

<table>
<thead>
<tr>
<th>Daily Traffic congestion index</th>
<th>[0,2]</th>
<th>(2,4]</th>
<th>(4,6]</th>
<th>(6,8]</th>
<th>(8,10]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestion levels on the road network</td>
<td>Blocked</td>
<td>Basically unblocked</td>
<td>Light congestion</td>
<td>Moderate congestion</td>
<td>Severe congestion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Data source: Beijing Institute of Transportation Development

According to the statistical results shown in Chart 7, the average traffic congestion index of the whole Beijing road network during peak hours in 2019 is 5.48, a slight decrease (1.08%) compared with the 5.54 index of the previous year, which is classified as “light congestion”.

The average morning peak traffic index is 5.08, and the average evening peak traffic index is 5.88. The evening peak traffic congestion degree is higher than the morning peak, with an increase of -0.39% and -0.02% respectively from 2018. According to the daily traffic congestion index rating standard, the morning and evening peak traffic is at the level of mild congestion and moderate congestion.

The average daily congestion time (moderate congestion and severe congestion) was 3 hrs in total, 5 mins less than that in 2018.

The morning rush hour congested roads are mainly in the north-south direction of the ring road and the main contact lines in the direction of Entering Beijing, while the evening rush hour congested roads are mainly in the north-south direction of the ring road and the main passageways in the direction of leaving the city. The chart below shows the annual...
traffic index of Beijing from 2007 to 2019.

Chart 7. Annual Traffic Index of Beijing from 2007 to 2019

Data source: Beijing Institute of Transportation Development

The traffic congestion index fell dramatically after the implementation of the lottery car purchasing scheme in early 2011, as can be seen from the split line chart of Beijing’s annual traffic index from 2007 to 2019. It demonstrates that the control of the policy of restricting car purchases is real and effective. The problem of more cars on the road can be addressed from the root by controlling the rate of private car ownership, thereby alleviating the problem of traffic congestion. Although the traffic congestion index dropped sharply in 2011 due to policy factors, it recovered slowly from 2012 to 2015. After 2015, the traffic congestion index declined year by year. From the overall trend of the data, it can be seen that the implementation of the traffic policy has been effective. The overall traffic congestion index has decreased significantly compared with that before 2010, and the traffic operation tends to be good on the whole.

However, it can be seen from the ups and downs of the data that the policy implementation has the characteristics of temporary and chronic mitigation of traffic conditions, and its persistence is insufficient and the effect is relatively small. About whether the policy clearly solved some congestion doesn’t give a definite answer, traffic congestion is affected by many factors, such as the traffic accident causes the short road congestion, roadway taking-up construction can lead to local traffic blocked, the bad weather will affect traffic capacity and so on, these can’t directly from the congestion index, the index of Beijing concluded that still need to combine various data analysis.

4.3.4 Ownership of Vehicles

Beijing’s central location, the high population concentration, the rapid rise in the number of motor vehicles and the high intensity of road usage have made Beijing ‘s traffic development face a serious situation. In response to this situation, the government has released a variety of administrative intervention policies to manage traffic congestion in Beijing, such as increasing the standard of parking fees, introducing the last-number traffic restriction policy, setting up the last-number traffic reduction policy, setting up bus lanes and so on.

In order to control the total number of motor vehicles in Beijing and alleviate the current situation of traffic congestion in Beijing, the much-concerned measures to alleviate traffic congestion in Beijing “Interim Provisions on The Regulation and Control of The Number of Passenger Cars in Beijing” and its implementation rules were launched on December 23, 2010, and the implementation rules are stipulated: In the future, Beijing will allocate an average of 20,000 vehicles per month through a lottery, with individuals accounting for 88 percent of the total, and each driver will be limited to one car. Vehicle registration is required to obtain vehicle configuration indicators through the “lottery” program.

According to estimates, by the end of 2011, the number of motor vehicles in Beijing was 4,983 m, 174,000 more than that of 2010, up 3.6 percent, due to the effect of regulatory and control policies on passenger cars. In Beijing, the number of motor vehicles was 5.20.0 million by the end of 2012, a rise of 217,000 or 4.4 percent over 2011. The progress has since shown a pattern of approximately exponential growth. In 2019, the number of motor vehicles in Beijing reached 6.365 million, 281,000 more than that of the previous year. Among them, the number of private motor vehicles reached 5.13 million, an increase of 236,000 over the previous year.

Chart 8. Chart of Motor Vehicle ownership and Incremental Change in Beijing from 2009 to 2019

By comparing the above-mentioned net increase and growth rate, it can be found that Beijing’s motor vehicle ownership growth trend has been higher than 10 percent since 2009 and is on the rise. However, the growth rate of vehicle ownership in Beijing has been substantially kept back since the implementation of the registration lottery scheme at the end of 2010, dropping from 19.7 percent to 3.6 percent, and the growth rate has since slowed down. It also proves that Beijing’s car-lottery policy has limited the natural growth of the number of vehicles.

After the introduction of the ‘car buying lottery’ policy in

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January 2011, the net increase in motor vehicles in Beijing in 2011 was 617,000 less than in 2010, effectively curbing the rapid growth of motor vehicles and to some extent alleviating the excessive traffic congestion in Beijing. The alleviation of traffic congestion does not mean the lottery scheme is going to die out. Beijing has a large number of motor vehicles, if it does not carry out certain “administrative control”, then the traffic congestion is bound to be more serious. At a time when the pace of public transport construction is not keeping pace with the growth of private cars, policies that restrict car purchases in the short term could help prevent traffic congestion from worsening. Therefore, the continuous “lottery car” has its practical significance.

5. Conclusions

To sum up, we find that the development of public transport has a significant effect under the support of policies, which can alleviate traffic congestion to a certain extent. In the meantime, the implementation of the policy of increasing the proportion of public transport trips is more effective. At the same time, increasing the number of parking lots and parking spaces, and increasing public transport lines can help to reduce traffic congestion. In addition, the provision of sufficient parking spaces can effectively alleviate the traffic congestion, and the rapid growth of motor vehicles was effectively curbed, which alleviated the traffic congestion to a certain extent in Beijing. Generally speaking, the measures released in 2010 have contributed to the prevention and control of traffic congestion in Beijing to a certain extent.

As many scholars believed, the rapid urbanization leads to the problem of urban traffic congestion. There is no specific way to solve the problem of traffic congestion around the world. However, a universal governance framework can be proposed. Each city can control traffic congestion within the framework and make some adjustments. [3] (Mahmoud Hassan, 2013) The same is true of Beijing’s traffic congestion. The root causes of the problem still exists, and the congestion problem has not been fundamentally and significantly improved. This is the reason why Beijing put forward various supplementary policies, such as relieving non capital functions, to solve the problem of congestion from the root.

We believe that Beijing can make more efforts in several aspects:

Firstly, we should speed up the process of relieving Beijing’s non capital functions. The urban polycentric theory advocates that the population should be scattered around rather than gathered in the central business district, and the residents’ work and living areas should be transferred outside the central area. For example, in Shanghai, from 1990 to 2000, Shanghai’s sub centers developed from two sub centers to six sub centers, and the population showed a trend of diffusion. In 2009, Wang Hongxia took Shanghai as a case. [4] Through research and analysis, she found that through years of efforts to form a multi-center layout and four level urban system, Shanghai has developed into a multi-center mode, which is an important reason why Shanghai has a large population and developed economy, but its traffic has not reached a moderate degree of congestion. Beijing can speed up the construction of the sub center, and make the new central area more attractive than the existing urban center, with more perfect functions, higher quality and better ecological environment. [5]

Secondly, we will implement the policy of collecting traffic congestion charges. In 2010, the traffic congestion charge was stipulated to be implemented on an optional basis, but it has not been widely implemented due to various considerations. [6] Beijing needs to improve its traffic information management system and combine congestion charges with the government’s travel incentive policies. For example, when congestion charges reach a certain amount, they can get free travel time cards of public transport, and encourage paying car owners to choose public transport mode.

Thirdly, we will increase the charges for underground parking lots in large consumption centers and CBD business centers.

It will take a long time to improve the traffic congestion in Beijing. Any policy intervention will not be immediate, so residents may not feel the obvious policy impact. However, as long as we start from the root causes and draw lessons from the world’s experience reasonably, we will surely have a great improvement.

References
