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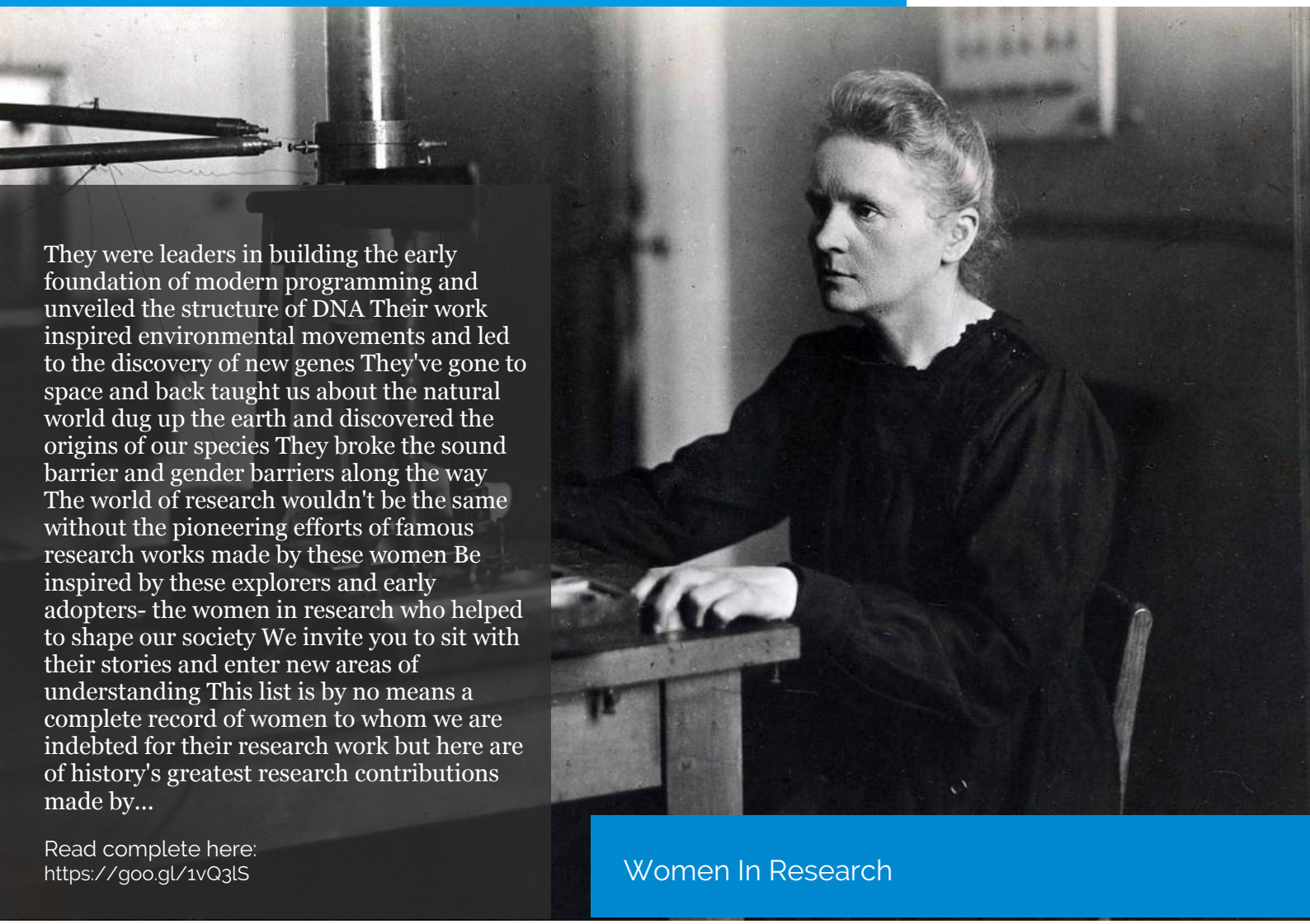

They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

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Women Promotion in Formal Wage Employment and Improving GDP Per Capita in Africa

Laïfoya Moïse Lawin[α] , Riana Navalona Ramonjamanana[σ]
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ABSTRACT

Over the past two decades, issues related to solid gender disparities have gained prominence in the labor market in developing countries. Previous studies have addressed the issue of women's discrimination in terms of the gender pay gap without addressing the real impact of women's promotion to formal employment on economic growth. This study examines the effect of women's advancement in formal jobs on GDP per capita.. To examine this relationship in sufficient depth, we used data from 40 African countries from 2000 to 2019 issued from the World Bank database, and we used Dumitrescu and Hurlin's (2012) Granger causality testing procedure and the GMM model. Results show a causal relationship between the labor force, investment, human development index, trade openness and the proportion of women in formal wage work, and the GDP per capita of African countries. Results of the GMM model show that investment, trade openness and the proportion of women in formal work have positive and significant effects on GDP per capita. Regarding policy implications, African countries should invest more, develop regional integration, and promote women's formal wage employment for sustainable and inclusive development.

Keywords: formal employment, salaried employment, discrimination, women, africa, GDP per capita.

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I. INTRODUCTION

After the establishment of the Millennium Development Goals (MDGs) in the early 2000s, labor market challenges have become more and more of an important issue for development policy. Previous centuries, women have tended to withdraw from the labor market when they marry and become mothers. This situation has its roots in the traditions and cultures of peoples and the principles developed during the nineteenth century by social theorists and economists. Theory of two spheres proposed by RUSKIN in 1864, supports the idea that the world of women is different from that of men[78]. This theory is based on the principles that women have a role as wives, mothers and educators, and therefore have a reserved place in the home, while men are the producers of wealth and resources. These principles or ideologies have contributed to limiting the prospects for development, for the advancement of women, and are at the root of the discrimination observed in our modern societies between men and women in the labor market[36-52-82-86] . The Sustainable Development Goals 2022 report, states that in 18 countries worldwide, men have the right to prevent their wives from working (UN, 2022). Also 49 countries do not have laws protecting women from domestic violence. This forces women to disproportionately engage in everyday work and the agricultural sector that does not offer social protections such as minimum wage and maternity leave [53-70]. Earlier study by Krogh et al (2009) shows that in developing countries, the majority of women work in the informal economy. Many are domestic workers or casual laborers in factories, while others are unpaid workers on farms.

In most developing and Sub-Saharan African countries, discrimination against women in the

labor market is high and the wage gap remains considerable. Indeed, Kolen et al.'s (2009) analyses of Sub-Saharan African economies reveal a significant gender pay gap. Average interval between women's and men's weekly earnings ranged from 23 percent (Burkina Faso) to 79 percent (Ghana). In Senegal in 2018, women's unemployment rate was nearly four times higher than men's (26 percent vs. 7.4 percent, respectively) and their labor force participation rate is 13.2 percentage points lower than men's [69]. In Ethiopia, Mali, and Mauritius, women spend 22 percent, 20 percent, and 19 percent of their day on domestic and caregiving tasks, respectively, while men spend 8.7 percent, 2.5 percent, and 4.8 percent of their day on these tasks, respectively.

The existing literature on this issue of women's formal employment and the gender wage gap justifies the observed gaps by women's lower level of education[8-73], and by issues of inadequate skills, a lack of knowledge of job search techniques, unpaid domestic responsibility, and mobility restriction [8-34-74-77]. Others the difference results from the disparity in the number of hours of work done at the service and the job held[46]. Other theoretical work has focused on three main explanations for gender gaps in labor markets[73]. These explanations cover the female labor supply side, namely (i) the human capital model [79-22], (ii) the household production model[22] , and (iii) the work-leisure choice theory.

According to Périvier et al (2018), women are also poorly represented in formal wage employment. Their share of wage employment in the non-agricultural sector remains relatively low, averaging about 36.5 percent worldwide, with significant disparities between countries. Lokina et al (2017) pointed out that in Tanzania, male workers account for 71 per cent of formal sector employment, while women are mainly employed in low-income jobs, such as unpaid family helpers. Estimates of UN in 2022 on the current status of the implementation of the SDGs reveal that at the current rate, the gender wage gap, which stands at 23% globally, will not be closed until 2086.

The low participation of women in formal jobs in developing countries raises the issue of under-utilization of a part of the labor force capable of contributing effectively to improved national wealth production and economic growth. Indeed, advocates of human capital or endogenous growth theory support the idea that both labor and capital factors contribute to improving economic growth and that the quality of the labor factor is a fundamental element in understanding the dynamics of growth. The different theories or ideologies have been endorsed by Mill (1909), Mincer (1958), Becker (1975), Barro et al (1994), Romer (1986, 1992), Amable (1992) and Lucas (1988). Most of these authors support the importance of employment in the socio-economic progress of nations. Work by Klasen (1999), Wang et al. (2016), and Aldén et al. (2021) has also shown the negative effect of gender inequalities in education and employment on development outcomes. However, our research has found that very few empirical studies have focused on the actual effect of promoting women into formal wage employment on economic growth.

In this perspective, the question that emerges in this research is: what is the effect on per capita income of promoting women to formal wage employment? Thus, in line with the reflections of previous studies, this study aims to examine the effect of an increase in the proportion of women in formal wage employment on GDP per capita in Africa.

There are real interests in analyzing the effects of the promotion of women to formal wage employment. On the one hand, these interests lie in the desire for national and international policies to give women financial autonomy and to reduce the various forms of discrimination between women and men in the labor market. Other hand, the study contributes to highlighting the stakes of the promotion of women to increase the creation of national wealth. The study could also contribute to the success of poverty reduction strategies, the fight against discrimination against women in the labor market and efforts to stimulate economic growth and development in Africa.

To achieve this objective, the paper is organized into 5 sections. After an introduction, the following section reviews theoretical and empirical literature on the subject. Literature review section is followed by the estimation methodology, followed by a section showing the results and the discussion, and the last makes a summary of the main points and policy recommendations.

II. LITERATURE REVIEW

The theoretical foundations of growth are based on the theory of endogenous growth, according to which the accumulation of human capital, the labor force (active population), investment (gross fixed capital formation), innovations and new technologies are at the origin of economic growth. This theory has been defended in the works of Nelson et al. (1966), Romer (1990), Barro (1991), Mankiw et al. (1992), Barro et al. (1994), Barro (1996) and Bloom et al. (1998). For most of these authors, human capital accumulation is the primary driver of economic development in the long run. Several other works such as Dalgaard et al (2001), Bucci (2008) and Strulik et al (2013) have shown the positive effect of education on human capital and economic growth. Fuente et al. (2006), Cohen et al. (2007), Lutz et al. (2008), Hanushek et al. (2012, 2015), and Cuaresma et al. (2014), Bouoiyour et al. (2002), Bolli et al. (2019), Fukao et al. (2021), Goenka et al. (2020), Han et al. (2020), Osiobe (2019) also showed a positive impact of labor force educational attainment on economic growth in Morocco. Essardi et al. (2017) Prettner et al. (2019), YEN et al. (2020), ACHCHAB et al. (2021). Affandi et al (2019) also found a positive and significant effect of education and literacy on economic growth in different developing countries.

Other research highlighted the critical role of workers' health on economic growth. Indeed, the work of Barro (1996), Knowles et al. (1997) and Bloom et al. (1998) have shown that improvements in life expectancy at birth have a positive and statistically significant impact on economic growth in these countries. Bloom et al. (2004) concluded that an increase in life expectancy of one year increases productivity by 4%. This positive effect of life expectancy at birth on the level of GDP per capita has been confirmed in the work of Ashraf et al. (2008), Essardi et al. (2017), Yen et al. (2020), Achchab et al. (2021), Bloom et al. (2019).

In recent years, other works have focused on the positive effect of investment on economic growth. Baneliene et al. (2020) confirmed the positive impact of investment on economic growth in EU countries. Lin et al (2018) found similar results for countries such as Mexico, Indonesia, Nigeria and Turkey. Also, these authors showed the negative effect of inflation on growth. Dinh et al (2019) also show that domestic investment has a positive impact in 30 developing countries in the lower middle income group. Lawin (2020) has also demonstrated the positive impact of investment on Benin's economic growth. The work of Asongu et al (2020) and Acquah et al (2020) has also highlighted the positive impact of ICT investment and development on the economic growth dynamics of sub-Saharan African countries and on the development of the financial sector in Africa.

Two arguments are often used in the literature to support the issue of women's contribution to the development and economic growth. The first argument is about job opportunities for women and their freedom to work in safety and dignity. The second argument is economic, highlighting women's financial capabilities and potential contribution to economic growth[58] (Krogh et al., 2009). Economic ideas are based on the fact that women tend to reinvest their income in improving the health, and education of household members. Thereby raising living standards and reducing non-income poverty. Thus, since the second half of the 20th century, several authors have emphasized the contribution of women to production and economic growth. They highlighted the existence of gender disparity in the labor market and the production process. For Sofer (1990), and Kabungu et al. (2021) this disparity manifests itself mainly in two forms, namely, a difference in wages in favor of men and a differential distribution of jobs by gender.. Analysts who have worked to identify critical factors underlying the dynamics of

disproportionate participation between men and women in labor markets find that the observed disparities are indeed due to limited employment opportunities, differences in educational attainment, power dynamics within households, different endowments of training and work experience, and industry [22-43-41-9-36-80-86-25]. Despite previous thinking, there hasn't been solid research on the effect of increasing the share of women in formal employment on economic growth. This study sets out to examine this effect in the case of African countries.

III. DATA AND METHODS

3.1 Data Source

This study uses a panel of 40 countries in Africa. The countries considered are Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Comoros, Congo, Democratic Republic of Congo, Egypt, Eswatini, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Libya, Madagascar, Mali, Mauritius, Mauritania, Morocco, Mozambique, Namibia, Niger, Nigeria, Uganda, Rwanda, Senegal, Sierra Leone, South Africa; Sudan, Tanzania, Togo, Tunisia. The selection of these countries is justified by the availability of the necessary data to conduct the analysis.The data used comes from the World Bank database from 2000 to 2019.

The variables used are essentially GDP per capita (GDP), gross fixed capital formation (GFCF), labor force (POPAc), consumer price index (CPI), trade openness (TO), wage and salaried workers, female (% of female employment) (TSF), and the human development index (HDI). The variable GDP per capita is an indicator of the country's level of development and economic growth.. It is the variable explained in this study. The choice of gross fixed capital formation and the working population is inspired by economic theory, which assumes that production in an economy is determined by capital stock (investment) and labor or human capital (working population). Trade openness then determines the variable wage and salaried workers, and female is the variable of interest. The World Bank defines salaried workers (employees) as workers who perform salaried work. They have a formal employment contract (written or oral) that provides them with a basic salary. The Human Development Index (HDI) is a combined indicator that includes life expectancy at birth and educational attainment, and thus is relevant for measuring the human capital.

3.2 Descriptive Statistics

The data cover the period 2000-2019, i.e., 20 observations per country and 800 observations for the panel. Table 1 below presents the proportion of women in formal wage employment (Wage and salaried workers, female (% of female job)). This table allows us to conduct two types of analysis: an analysis according to the participation rate of women in formal wage employment and a study of whether there is an improvement in women's participation in formal wage employment from one decade to the next. Referring to the column for the period 2000-2019, fourteen (14) countries in Africa have an average rate below 10%. This means that over 2000-2019, less than 10% of employed women were in formal wage jobs in these countries. Ten (10) countries out of 40 have an average speed between 10% and 20%, six (6) countries have an average speed between 20% and 50%, and ten (10) countries have an average rate between 50 and 85%. Among the countries with an average speed between 50 and 85% over the period 2000-2019, we have Algeria, Botswana, Egypt, Eswatini, Gabon, Libya, Mauritius, Namibia, South Africa, and Tunisia. At the second level of analysis, the table shows that from one decade to the next, some countries have made progress while others have experienced a decline. From the decade 2000-2009 to the decade 2010-2019, countries such as Comoros, Gabon, Kenya, and Rwanda have, for example, recorded an average improvement of more than 10% in the rate of formal wage employment of women in work, which reflects a good policy of promoting women in job in these countries.

Table 1: Descriptive statistics

COUNTRY	2000-2009	2010-2019	2000-2019	COUNTRY	2000-2009	2010-2019	2000-2019
South Africa	79,3	87,0	83,1	Madagascar	10,6	8,3	9,5
Algeria	67,4	74,2	70,8	Mali	8,1	10,6	9,3
Angola	21,4	14,5	17,9	Morocco	33,4	37,2	35,3
Benin	4,5	5,1	4,8	Maurice	84,4	84,7	84,6
Botswana	70,7	71,8	71,2	Mauritania	24,3	26,2	25,3
Burkina Faso	3,5	9,1	6,3	Mozambique	3,5	5,6	4,6
Burundi	14,6	11,5	13,0	Namibia	54,7	58,3	56,5
Cameroon	9,3	13,9	11,6	Niger	8,9	4,3	6,6
Comoros	18,4	29,1	23,7	Nigeria	9,6	13,3	11,4
Congo, DRC	4,2	9,3	6,7	Uganda	8,5	14,8	11,6
Congo	7,8	9,2	8,5	Central African Republic	4,2	3,6	3,9
Egypt	54,7	57,9	56,3	Rwanda	9,1	20,5	14,8
Eswatini	64,0	59,6	61,8	Senegal	16,9	25,6	21,3
Gabon	51,5	62,3	56,9	Sierra Leone	3,5	4,2	3,8
Gambia	12,5	15,9	14,2	Sudan	30,8	33,8	32,3
Ghana	9,6	15,9	12,7	Tanzania	5,0	9,5	7,3
Guinea	2,6	2,3	2,5	Chad	1,3	1,5	1,4
Guinea-Bissau	17,1	17,7	17,4	Togo	6,1	8,9	7,5
Kenya	22,3	36,5	29,4	Tunisia	73,5	82,3	77,9
Libya	67,0	65,5	66,2	Ivory Coast	7,2	13,7	10,4

Source: World Bank data, authors' calculation

Some descriptive statistics on the variables studied are presented in Table 4. Table 5 in the appendix presents the correlation matrix between the variables looked at and shows that the labor force, gross fixed capital formation, and the CPI are significantly correlated with GDP per capita. Similarly, the variable wage and salaried workers, female (% of female employment) (TSF) is positively and significantly correlated with GDP per capita (0.79).

The scatter plots in Figure 1 and 2 show a probable relationship between the variable Wage and salaried workers, female (% of female employment), and GDP per capita on the one hand and between the human development index and GDP per capita on the other. The analysis in Figure 1 shows that countries with a high level of female participation in formal employment have a higher level of development. Figure 2 shows that the higher a country's HDI, the higher it is level of development. However, we conducted a multivariate analysis in an econometric framework to situate the relationships better.

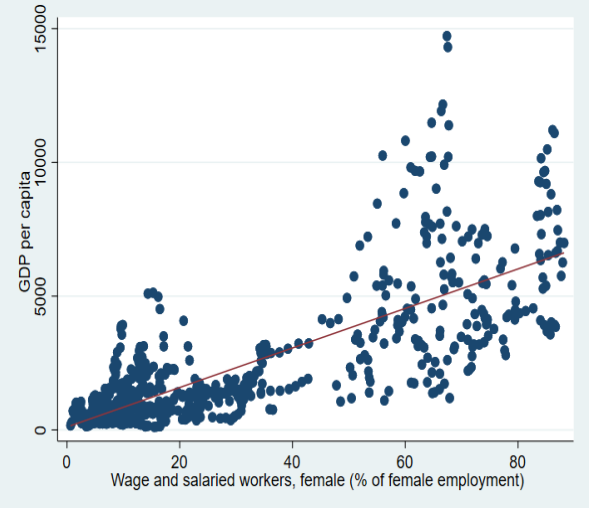

Figure 1: GDP per capita and wage and salaried workers, female (% of female employment); Source: Authors' representation

Figure 2: GDP per capita and Human Development Index, Source: authors' representation

Causal link

The idea of testing for causality in econometric models goes back to the work of Granger (1969). It is based on the idea that if one variable X causes another variable Y, adding the lagged variable of X in a regression of Y on its own lagged values and other explanatory variables should significantly improve the predictive power of the model[13]. The value of performing this test in panel data comes from the fact that the availability of a large amount of data improves the properties of the test statistics, especially in the case of a small time dimension sample[59]. The causality test we use in this paper is inspired by the work of Dumitrescu and Hurlin (2012) and Aye et al. (2017). This test accounts for potential heterogeneity across countries. The basic specification of the Dumitrescu and Hurlin(2012) test is given by the model below, in which we consider two stationary variables, X and Y.

$$Y_{i,t} = \lambda_i + \sum_{k=1}^{K} \alpha_{1i}^{(k)} Y_{i,t-k} + \sum_{k=1}^{K} \beta_{1i}^{(k)} X_{i,t-k} + \varepsilon_{1i,t} \qquad i = 1, \ldots, N; t = 1, \ldots, T$$

Under the null hypothesis of homogeneous non-causality, there is no causality from X to Y for all the crossover units in the panel.

$$H_0: \beta_i = 0 \quad \forall\ i = 1, \ldots, N$$

The alternative hypothesis assumes the existence of causality from X to Y for at least one country.

$$H_1: \beta_i = 0 \quad \forall\ i = 1, \ldots, N_1$$

$$\beta_i \neq 0 \quad \forall\ i = N_1, \ldots, N$$

The null and alternative hypothesis of causality from y to x is specified in the same way. To test these hypotheses, Dumitrescu and Hurlin (2012) propose a procedure that involves running the N individual regressions of the model and performing F-tests of the K linear hypotheses $\beta_{i1} = \ldots = \beta_{iK} = 0$ to recover the individual Wald statistic W_i and finally to compute the average Wald statistic $\underline{W}$:

$$\underline{W}_{NT} = \frac{1}{N}\sum_{i=1}^{N} W_{iT}$$

where W_{iT} is the individual Wald statistics for the Granger causality test. Assuming that the statistics W_{iT} are independent and identically distributed, we calculate a standardized statistic, Z-bar:

$$\underline{Z} = \sqrt{\frac{N}{2K}}\ (\underline{W} - K) \underset{T,N \to \infty \to}{\overset{d}{}} N(0,\ 1)$$

The Panel Model

To examine the effect of an increase in the female participation rate in formal wage employment on GDP per capita, we assume a Cobb-Douglas production model whose panel data specification is given by $Y_{it} = A_o K_{it}^{\alpha} L_{it}^{\beta}$

$$PIBh_{it} = f_{it}(POPAc,\ FBCF,\ IPC, TSF, OUV, IDH) + u_{it}$$

$PIBh_{it}$ is the dependent variable of the model and $PPOPAc,\ FBCF,\ IPC,\ TSF,\ OUV,\ IDH$ are the explanatory variables of the model and ε_{it} the error term. The linear form of this model is:

$$lnPIBh_{it} = \beta_0 + \beta_1 lnPOPAc_{it} + \beta_2 lnFBCF_{it} + \beta_3 lnIPC_{it} + \beta_4 ln\,TSF_{it} + \beta_5 lnOUV_{it} + \beta_6 IDH_{it} + u_{it}$$

Where β_0 is the constancy and β_1, β_2, β_3, β_4, β_5, β_6 are parameters to be estimated.

Hasciao test of Homogeneity of the parameters

The preliminary test for any estimation using panel data is the Hasciao test, which ensures that the parameters to be estimated are homogeneous for all countries. The results of this test (see table 6) confirm the hypothesis of homogeneity between the parameters.

In this study, the time dimension is less than 30 for each country, which does not allow us to test specific hypotheses, such as the stationarity test of the series. The individual size (N) is equal to 40, while the time dimension (T) is equal to 20. Moreover, the first-order lag (GDP(-1)) of GDP per capita (explained variable) is significantly correlated with GDP, which points to a dynamic GMM model.

GMM Model

The estimation procedure adopted in this paper was inspired by the work of Lawin et al. (2022). We specified the empirical model in the following form:

$$lnPIBh_{it} = \beta_0 + \beta_1 lnPOPAc_{it} + \beta_2 lnFBCF_{it} + \beta_3 lnIPC_{it} + \beta_4 ln\,TSF_{it} + \beta_5 lnOUV_{it} + \beta_6 lnPIBh_{it-1} + \beta_7 IDH_{it} + u_{it}$$

In this specification, $PIBh$ is the GDP per capita label; $FBCF$ is the gross fixed capital formation; POPAc indicates the labor force; IPC is the consumer price index; OUV is the degree of trade openness; and $TSF$is wage and salaried workers, female (% of female employment). $u_{it} = \mu_i + \nu_{it}$ with μ_i is the country-specific constant term that captures unmeasured heterogeneity, and ν_{it} is the error term, i = 1,2, ..., N is the country, t = 1,2, to T, is the time and β_0 is the constancy, and β_1, β_2, β_3, β_4, β_5 β_6; β_7 are parameters to be estimated.

Because of the inclusion of a lagged dependent variable in the right-hand side of the equation, some econometric issues need to be considered for a reasonables estimation of the model. The error term includes unobserved and time-invariant characteristics (fixed effects) of countries and thus is most likely correlated with the regressors. Note that $PIBh$ and its first-order lag depend on μi, and thus $PIBh_{i(t-1)}$ is necessarily associated with u_{it}. The dynamic GMM model used in this paper provides a better property of the estimators and other advantages. The GMM accounts for variable omission bias which are considered important determinants of growth and are correlated with some explanatory variables but may be omitted in the regression model. For more details on these advantages, see Lawin (2022).

The GMM technique comes in two versions: the difference GMM, where lagged levels of the explanatory variables are used as instruments, and the GMM systems, where a combination of difference and level regression is used. Bond et al. (2001) recommended that the GMM system estimator developed by Arellano et al. (1995) and Blundell et al. (1998) can significantly improve the efficiency and avoid the problem of weak instruments in the GMM estimator in the first place. Windmeijer (2005) showed from Monte Carlo simulations that the estimated asymptotic standard deviations of the two-stage GMM estimator could be biased in a finite sample. the correction procedure proposed by Windmeijer (2005). The consistency of the GMM estimator depends on two things: the validity of the assumption that the error term is not serially correlated (AR (2)) and the fact of the instruments (Hansen test). In what follows, we will use the GMM system estimator developed by Arellano et al. (1995) and Blundell et al. (1998) to estimate the parameters of our regression

The combined result of these methods leads to the results presented in the section below.

IV. RESULTS

The causality relationships between the explained variable and the explanatory variables are examined by the panel causality test of Dumitrescu et al. (2012). The results show the existence of a causal relationship between the labor force to GDP per capita on the one hand and investments (FBCE) to GDP per capita on the other hand. Indeed, the probabilities associated with the causality test are 0.0000 for the working population and 0.0057 for gross fixed capital formation, values that are well below 5%, the threshold considered. Similarly, there is a causal link between trade openness and GDP per capita on the one hand and between the consumer price index and GDP per capita on the other. Furthermore, the results show the existence of a causal relationship between the variable wage and salaried workers, female (% of female employment) to GDP per capita, with almost zero probability of being wrong (P-value = 0.0000). Estimation results show that the human development index (HDI) causes economic growth (GDP). These results imply that investment, labor force, inflation (consumer price index), trade openness, and wage and salaried workers, female (% of female employment), and the human development index have predictive

power or capacity on economic growth (GDP per capita) in African countries.

Table 2: Results of the Dumitrescu and Hurlin's (2012) panel causality test

	W-bar	Z-bar	p-value
POPAc does not Granger-cause PIBh	3.12	9.61	0.00
FBCF does not Granger-cause PIBh	1.61	2.76	0.001
ouv does not Granger-cause PIBh	3.26	10.23	0.00
TSF does not Granger-cause PIBh	2.19	5.42	0.00
IPC does not Granger-cause PIBh	8.11	9.31	0.00
IDH does not Granger-cause PIBh	5.71	21.09	0.00

Source: World Bank data, authors' calculations

Table 3: Result of the GMM model

LPIBh	Coef.	t.Err.	p-value	Sig
LPIBh(-1)	0.844	0.057	0.000	***
IDH	0.043	0.304	0.886	
LFBCF	0.086	0.043	0.048	**
LPOPAc	-0.079	0.047	0.096	*
LTSF	0.047	0.023	0.041	**
LOUV	0.067	0.033	0.041	**
LIPC	-0.062	0.029	0.031	**
Constant	0.347	0.234	0.138	
Arellano-Bond test for AR(1) in first differences: z = -2.76 Pr > z = 0.006				
Arellano-Bond test for AR(2) in first differences: z = -1.04 Pr > z = 0.297				
*** p<.01, ** p<.05, * p<.1				

Source: World Bank data, authors' calculations

The table analysis shows that gross fixed capital formation has a positive and significant effect on GDP per capita. This result confirms the results of numerous empirical studies involving economic growth and investment. Trade openness also has a positive and significant impact on GDP per capita. This result corroborates the findings of Baliamoune-Lutz et al. (2009; 2015) and Baliamoune-Lutz (2020), who showed that greater integration into the global market could result in higher growth but it would be associated with lower gender equality. Chen et al. (2013) also find that foreign participation, export orientation, female employment, and gender wage equality

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within the same region and industry have a positive impact on growth. On the other hand, inflation reduces economic growth in African countries. The results show that the effect of the human development index is positive but not significant on economic growth. In addition, the variable wage and salaried workers, female (% of female employment), have a positive and significant effect on GDP. From the above, it is worth noting that a 10% increase in wage and salaried workers, female (% of female employment) increases GDP per capita by about 0.47%. In the same way, a 10% increase in the gross fixed capital formation and in the trade openness increases GDP per capita respectively by 0.86%, and 0.67%. Whereas, a 10% increase in the CPI decreases GDP per capita by 0.62%. Furthermore, the validation assumptions of the robustness of the model are verified. Indeed, the errors AR (2)) are not correlated, and the results of the Sargan and Hansen tests show a suitable property of the estimators.

V. DISCUSSION

This study examines the vital role or contribution of women employment in the development and wealth creation of African developing countries. The results of this study show that investments, by their positive and significant effects on the GDP per capita, are eminent for the development of African countries. This result contributes to the theoretical work of a link between production and capital stock or investments. It also confirms the empirical results of several authors, including Lin et al. (2018), Lawin (2020), Baneliene et al. (2020), Dinh et al. (2019), Asongu et al. (2020) and Acquah et al. (2020). The results show that investments are eminent for the development of African countries.

Our results also show that the parameter associated with the active population has a negative sign, reflecting its perverse effect on GDP per capita in the case of African countries. This result can be justified by the fact that an increase in the labor force that is not accompanied by an improvement in labor productivity should reduce the income per capita. Another possible explanation is that the majority of the labor force in African countries is underemployed or has precarious jobs that do not allow them to contribute fully to wealth production. e Other hand, regional integration is also essential in policies aimed at developing the African continent insofar as the variable of trade openness has a positive and significant effect on the GDP per capita of African countries. Its relative importance compared to investments is 72%. Thus, assets must be accompanied by regional integration to take advantage of comparative advantages, as specified by David Ricardo and Heckscher-Ohlin-Samuelson (HOS) in their theories of international trade.

Other hand, growth induced by investment and regional integration must be supported by moderate inflation. It was shown that an increase in the consumer price index reduces the GDP per capita.. A causal link was also established between the human development index (HDI) and the economic growth of African countries. However, the estimated parameter shows a positive and non-significant effect. This result can be explained on the one hand by the fact that massive investments are expected in the education and health sectors of African countries to improve human capital. On the other hand, academic and professional training is much more theoretical in most African universities, which does not allow students to be operational at the end of their training. It is important to emphasize that formal wage employment for women is necessary, especially in developing countries where poverty and misery still prevail. Working in the legal sector transcends relatively high wages to include other benefits such as job protection. Such jobs guarantee women social security, maternal and sick leave, training opportunities, and job mobility. Formal wage employment should increase women's income and thus of her household. That would create some space for investment in health and education, which in turn improves well-being, the productive capacity of the workforce, and economic growth.

VI. CONCLUSION AND RECOMMENDATION

This study examines the effect of promoting women's access to formal wage employment on

economic growth in African countries. It examines the impact of increasing women's access to formal wage employment on GDP per capita in African countries. To achieve this objective, we collected panel data from the World Bank database for 40 African countries from 2000-2019. We then examined the existence of a causal relationship between the explained variable and the explanatory variable based on the work of the panel causality test by Granger (1969) and Dumitrescu and Hurlin, (2012). The dynamic GMM model was used to estimate and examine the temporal dynamics and effects of the explanatory variables on the explained variable.

The results support a causal link between the labor force, investment (GFCF), consumer price index, human development index (HDI), trade openness, and women's access to formal wage employment to GDP per capita. The results of the econometric model showed that a 10% increase in the rate of women's access to formal wage employment increases GDP per capita by 0.47%; a 10% increase in the gross fixed capital formation increases GDP per capita by 0.86% and a 10% increase in trade openness increases GDP per capita by 0.67%. It also appears that inflation reduced economic growth in African countries. Indeed, a 10% increase in the consumer price index reduces GDP per capita by 0.62%.

From all the above, the recommendations for African countries are to make massive investments, and particularly in regional integration and to implement policies for the promotion of women in wage employment to have a sustainable and inclusive development. This last part can be done by putting in put legislative provisions facilitating women's access to the labor market.

Conflict of Interest Statement

The authors state that there is no conflict of interest.

Ethical Approval

The data used for the estimates do not include confidential information about individuals or animals that may raise ethical concerns.

Consent for Publication

The authors grant his consent for publication of this paper.

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DATA AVAILABILITY STATEMENT

The data used in this paper is fully available and can be accessed upon request.

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APPENDIX

Tableau 4: Statistiques descriptives

Variable	Obs	Mean	Std. Dev.	Min	Max
PIBh	800	2109.957	2428.814	113.567	14721.869
POPAc	800	7994038.9	9805653.9	126872	62151626
FBCF	800	8.963e+09	1.604e+10	6974332	1.104e+11
TSF	800	26.762	26.054	.62	88.18
OUV	800	64.751	27.664	1.219	175.798
IPC	800	106.274	70.456	2.909	1344.193
IDH	800	0.503	0.122	0.252	0.804

Source: Données de la Banque mondiale, Calcul des auteurs

Table 5: Correlation matrix

Variables	(1)		(3)	(4)	(5)	(6)	(7)	(8)
(1) GDPh	1.000							
(2) L.PIBh	0.973*	1.000						
	(0.000)							
(3) CPI	0.091*	0.099*	1.000					
	(0.010)	(0.006)						
(4) HDI	0.801*	0.799*	0.174*	1.000				
	(0.000)	(0.000)	(0.000)					
(5) GFCF	0.318*	0.314*	0.188*	0.424*	1.000			
	(0.000)	(0.000)	(0.000)	(0.000)				
(6) POPAc	-0.088*	-0.089*	0.133*	0.070*	0.687*	1.000		
	(0.013)	(0.014)	(0.000)	(0.047)	(0.000)			
(7) TFS	0.791*	0.789*	0.053	0.845*	0.356*	-0.065	1.000	
	(0.000)	(0.000)	(0.132)	(0.000)	(0.000)	(0.068)		
(8) OUV	0.402*	0.393*	-0.146*	0.391*	-0.136*	-0.316*	0.357*	1.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
*** p<0.01, ** p<0.05, * p<0.1								

Source: World Bank data, authors' calculations

Table 6: Hasciao test of Homogeneity of the parameters

	F1	F2	F3
Value	45.175589	41.682236	4.4194295
P-value	0.000	0.000	0.000

Source: World Bank data, authors' calculations

Role of Leisure Acts and Mental Health

Anju Beniwal

ABSTRACT

According to the World Health Organization health is a state of complete mental, physical, and social wellbeing or we can say the absence of disease. It is the situation to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs and, on the other hand to change or cope with the environment." (Health Promotion Glossary, p. 1).

Keywords: leisure acts; mental health; environment; well-being; individual etc.

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According to the World Health Organization health is a state of complete mental, physical, and social wellbeing or we can say the absence of disease. It is the situation to which an individual or group is able, on the one hand, to realize aspirations and satisfy needs and, on the other hand to change or cope with the environment." (Health Promotion Glossary, p. 1).

Health and Welfare Canada in 1986, mentioned that health must be viewed in terms of resource which gives ability to manage and change our surroundings. (Achieving Health for All, p. 3). Health is something not only experienced individually, but also collectively. In other words, health shows importance, more on the nature of their interaction with the wider environment. "Environment" here includes not only our physical surroundings, but also the social, cultural, regulatory and economic conditions and influences that impinge on our everyday lives.

Through this theoretical paper I am presenting a view that healthy and constructive leisure acts perform an important role in maintaining mental health. Mental health and leisure acts related with each other; we can't achieve mental health without doing leisure acts.

Keywords: leisure acts; mental health; environment; well-being; individual etc.

I. INTRODUCTION

A mentally healthy person recognises his or her own abilities, which helps a person to know how to cope with the ordinary stresses of life and enhance the productivity of work. It forms the bases not only for individual well-being but also the good functioning of a community. It is not an individual trait, but it is regarded as a resource consisting of the energy, strengths and abilities of the individual interacting effectively with those of the group and with opportunities and influences in the environment. Mental or emotional health reflects our overall psychological well-being. Good mental health isn't just the absence of mental health problems. Being mentally or emotionally healthy is much more than being free of depression, anxiety, or other psychological issues. Mental and emotional health refers to the presence of positive characteristics of our behaviour. Sometimes people may not have negative feelings, they still need to do things that make them feel positive in order to achieve mental and emotional health.

Similar to quality of life, leisure is a term that for most people is ambiguous and difficult to define. The concept of leisure is complex and more challenging to comprehend than one might first believe. Leisure refers to participation in certain activities that are diversion and bring happiness or relaxation either on a personal or interpersonal level, it is a state of mind, a mental or possibly even spiritual place where one escapes from the stresses of life. Researchers and practitioners need to appreciate the dynamics and role of leisure in order to fully understand quality of life. (Roehrer Institute, 1989). One of the key factors in resilience is the ability to balance stress and our emotions. The ability to recognize our feelings and express them appropriately helps us avoid getting stuck in depression, anxiety, or other negative mood states. Another important factor is a strong support network. Trusting people, you can turn to for encouragement and support will promote resilience in difficult times. Individuals with disabilities, regardless of the type or nature of their condition, are likely to face certain challenges as they seek a higher quality of life. Participation in healthy and creative leisure should be an important and meaningful part of every person's life. Whether perceived as free time away from work, a set of activities chosen for

relaxation, entertainment or enjoyment, or simply a 'state of mind' to which one is saved for peace or reflection, leisure is defined as a valued as an important feature of life. Leisure and leisure activities also serve as the primary means by which people come into contact with each other and form relationships that support good mental health.

II. CONCEPTUAL FRAMEWORK AND HISTORICAL PERSPECTIVES OF LEISURE

Most meaningful relationships result from spending significant time with others in settings of leisure or free time activity (Godbey, 1999). If a person is unable to participate satisfactorily in leisure, especially with others or in the presence of others, he or she is probably not going to develop the skills, confidence, or opportunities necessary to forge interpersonal relationships. Professionals within the fields of recreation and leisure studies have gathered a large body of knowledge about leisure. It includes a historical perspective on leisure as well as an analysis of its role in contemporary society (Kelly and Freysinger, 2000). Scholars have dedicated themselves to examining the role of leisure within developing societies and cultures throughout time (Huizinga, 1950; Pieper, 1963). Leisure is a primary vehicle through which people come in contact with one another, relationships are formed, and mental health takes place.

Leisure is conceptually different from "recreation" or "play" though the terms are often used interchangeably. Recreation is thought of as activity that is structured, typically done with others and physical in nature such as organized sports. Playing or being playful, on the other hand, is used to describe activities or an attitude which is usually more carefree, spontaneous, or childlike. It is important to note that the same activity experienced by different people can be recreation for some, leisure for others, and play for yet others. Also, an activity for one individual, on different occasions or within different settings, can be viewed as leisure at one point in time and recreation at another (Godbey, 1999) for example if a person chooses to spend part of a lazy afternoon shooting baskets at home without any real purpose in mind, he might consider that leisure. Later in the day he may invite friends over to play basketball and enjoy an hour of exercise, laughter, and spontaneous fun. That weekend he goes to the community centre that is hosting a recreational league where his basketball team is in the championship game. In this setting, competition is keen, teamwork is stressed, and winners and losers emerge. A similar analysis can be made of most, if not all, leisure activities in determining the times and places where characteristics of recreation, leisure and play emerge or shift as the nature of the activity changes.

Leisure and recreation have a place in the history of civilizations. Changes in social institutions, as well as technological advancements, have impacted the way leisure has been perceived and experienced. Leisure has, however, always existed though its form, nature, and purpose have been fluid (Goodale and Godbey, 1988). Notably, ancient Romans were famous for their pools and public baths, as were the Greeks, who also instituted the Olympic Games. Secular and religious advancement in the Middle Ages defined the parameters of leisure within the lifestyles of that era. Martin Luther led the Protestant reformation that saw idleness as a sin (Linder, 1970) thereby impacting what people did in their free time. In later years as European civilization spread to the Americas, the Puritan influence placed utmost importance on work and productivity and taught that leisure existed primarily for religious contemplation (Goodale and Godbey, 1988).

III. ROLE OF LEISURE IN THE LIVES OF INDIVIDUALS FOR MENTAL HEALTH

Leisure plays different role in the lives of individuals. For all children, leisure exists as play, and play constitutes a large part of child development (Seefeldt, 2001). Human beings at a young age learn to walk, talk, move about, relate to people, and express individuality mostly through the context of play (Ellis, 1973; Jenkinson, 2001). Eisert and Lamorey (1996)

studied children and reported that assessment of children's play is an effective method to ascertain the strengths and weaknesses of important mental developmental domains.

As children become adolescents and then young adults, with or without disability, experiences of entertainment and leisure impact self-identity and esteem. (Shaw, Kleiber and Caldwell 1995). Widmer, Ellis and Trunnell (1996) state that special leave choices may put adolescents at increased risk for engaging in delinquent behavior. Wisely chosen entertainment, however, is more likely to result in positive outcomes. Adolescents' participation in sports programs for both mental and physical development: (a) provided an overall sense of competence in skills (transferable to other settings), (b) served as an outlet for expression of emotion, (C) allowed interaction with others in a social context not readily available in schools or other environments, and (D) provided a sense of independence and decreased awareness of disability. McKenney & Dattilo (2001) demonstrated that interventions associated with sports had some effect on the pro-social behaviour of adolescents with disruptive behaviour disorder although already existing antisocial behaviours did not appear to be diminished. These authors earlier studied leisure's role in the development of values, and stress the importance of choices made and behaviours formed during and within the context of leisure (Dattilo and McKenney, 2000). Similarly, a person who lacks self-esteem or identity, or seems to avoid relationships, may possibly be one for whom healthy recreation and leisure in social settings has been noticeably absent or problematic.

Mature young males and females realize at some point that their bodies are capable of reproduction, that they have a reproductive identity (Marsiglio, 1998). It is of great importance for overall identity formation and the vibrancies of one's self-concept. Sex often changes within a marriage or cohabitation relationship as most partners are committed to a monogamous relationship and sex falls within the day-to-day routine of two people's lives. Sex is certainly recognized as the mechanism through which children are conceived, but sex for physical and emotional bonding and sex for fun and pleasure is still the primary reason many people have sex. However, single adults who are sexually active are more likely to view sex as entertaining, compared to married men and women. (Michael, Gagnon, Laumann and Kolata, 1994). As people grow older, it is also likely they will have more and more discretionary time and more opportunities to participate in leisure. Through adulthood and into retirement years, although the type of activities may change, the importance of healthy leisure does not diminish. While the likelihood of obtaining a disability increases with age (Soldo and Freedman, 1994), interest in leisure activities remains strong. In fact, a recent survey commissioned by the American Association of Retired People reported that older Americans (aged 50+) place a high priority on activities such as spending time with family, socializing with friends, reading, and spending time on hobbies and exercise for mental or emotional health.

IV. BARRIERS TO PARTICIPATION & CRITICAL ISSUES OF LEISURE

Barriers, often referred to as "barriers" in leisure literature, are important to this discussion of leisure and people with disabilities. Constraints are things that interfere with a person's ability to learn about, use, or participate fully in leisure. Jackson and Scott (1999) described there are three categories of constraints: intrapersonal, interpersonal, and structural. Intrapersonal constraints are defined as individual psychological attributes, such as poor self-confidence or recollection of past negative socialization, which interfere with the development of leisure preferences or the type of activities one finds enjoyable. Interpersonal constraints are barriers that emerge as social interaction takes place between family, friends, or others. Barriers of this nature can include negative interactions with same age peers, communication difficulties, or patterns of social isolation. Structural constraints refer to things such as lack of transportation, limited financial resources, stigmas against people with disabilities

or inaccessibility of community programs that diminish the level of participation in leisure desired by the individual.

While everyone occasionally has a problem or situation that limits or prevents what they do during free time, persistent barriers to leisure eventually lead to a lower quality of life. Another example of a structural constraint may be the harmful effects of drugs that may act to disrupt normal physical, psychological or emotional function at leisure and physical activity for mental or emotional health. On the other hand, properly prescribed and administered medications can improve function and reduce symptoms of illness and promote positive leisure and healthy mental experiences. This approach to barriers to leisure participation can help to understand and reduce the barriers that people with disabilities may face (Jackson and Scott, 1999). As an area of scholarly exploration leisure has been dissected and studied from many angles. Numerous issues have been identified and examined for their potential constraints on healthy leisure. Some of these include alcohol and drug use, personality and attitude, social class and race, sexual orientation, religion, gender-based roles and dynamics involved with masculinity and femininity. Understanding the phenomenon of alcohol and drug use as it relates to leisure is important. While alcohol and drugs are a potential problem for people of all ages, they are commonly found in the leisure environments of young people (Duffy, 2001).

If abused, alcohol or drugs can pose serious physical, emotional, Gender roles and masculine/ feminine traits also heavily impact the opportunities offered in leisure activities and in recreational settings (Aitchison, 1999). Many believe there are actual physiological differences between the brain and its chemistry for men and women (Blum, 1997; Moir and Jessel, 1991). Regardless of whether such structural differences in the brain exist, males and females, conditioned by cultural mores and societal values affecting thought and behaviour, often choose to participate in different activities. If participating in the same activities, males and females often seek and experience different outcomes i.e., social and legal problems (Parker, 1998). Carruthers (1993) explored the ways in which individuals expect that alcohol consumption will affect their leisure experiences as being dependent on the leisure context. Media and advertisers promote an image of health and beauty to influence consumers. Thus, the physical and emotional benefits of leisure activity sometimes is forced to take a backseat to fashion, accessories or high-priced equipment which is more about promoting social status than recreation participation (Wynne, 1990).

V. PHYSICAL HEALTH IS CONNECTED TO MENTAL AND EMOTIONAL HEALTH

Taking care of your body is a powerful first step towards mental and emotional health. The mind and the body are linked. By improving physical health, automatically experience greater mental and emotional well-being. For example, exercise not only strengthens our heart and lungs, but also releases endorphins, powerful chemicals that energize us and lift our mood. The activities engage in and the daily choices make affect the way feel physically and emotionally.

- *Adequate Rest:* For good mental and emotional health, it is important to take care of your body. This includes getting enough sleep. Most people need seven to eight hours of sleep each night to function optimally.
- *Good Nutrition:* The topic of nutrition is complex and not always easy to put into practice. But the more you learn about what you eat and how it affects your energy and mood, the better you can feel.
- *Exercise daily:* Exercise is a powerful antidote to stress, anxiety, and depression. Look for small ways to add activity to your day, such as taking the stairs instead of the elevator or going for a short walk. To get the most mental health benefits, aim for 30 minutes or more of exercise per day.
- *Avoid alcohol, cigarettes and other drugs:* these are stimulants that can unnaturally make you feel good in the short term, but have long-term negative consequences for mood and emotional health.

- *Manage stress levels:* Stress takes a heavy toll on mental and emotional health, so it is important to keep it under control. Although not all stress can be avoided, stress management strategies can help bring things back into balance.
- *Limit unhealthy mental habits such as anxiety:* try to avoid becoming absorbed by repetitive mental habits - negative thoughts about yourself and the world that suck up time, drain your energy, and cause anxiety, fear and trigger feelings of depression.
- *Appeal to the senses:* Stay calm and energized by appealing to the five senses: sight, sound, touch, smell and taste. Listen to music that lifts our mood, places flowers where we'll see and smell them, massage our hands and feet, or sip a hot beverage.
- *Engage in meaningful, creative work :* do things that challenge our creativity and make us feel productive, whether we are paid for it or not - gardening, drawing, writing, playing an instrument, or something in our workshop things like making.
- *Get a pet :* Yes, pets are a responsibility, but taking care of one makes us feel needed and loved. There is as much unconditional love as love can give a pet. Animals can also take us out of the house for exercise and expose us to new people and places.
- *Make leisure time a priority :* don't do things for any other reason than they enjoy doing. Go to a fun movie, take a walk on the beach, listen to music, read a good book, or talk to a friend. Doing things just because they are fun is not an indulgence. Sport is an emotional and mental health necessity.

Everyone is different as we know; Not all things will be equally beneficial to all people. Some people feel better at rest and slow down while others need more activity and more stimulation or stimulation to feel better. The important thing is to find an activity that we enjoy and that encourages us.

VI. RECREATION'S THERAPEUTIC NATURE: A DISCIPLINE'S FOCUS

The discipline of recreation therapy (also commonly referred to as therapeutic recreation) provides services to people with disabilities related to their need to access and participate in a meaningful leisure lifestyle. With some 40,000 practitioners within the United States, the profession of recreation therapy promotes the right to leisure for people with disabilities (Sylvester, 1992) and has served as the principal nexus between the recreation and leisure sciences and disability studies. Recreation therapy is defined as using "treatment, education and recreation services to help people with illnesses, disabilities and other conditions to develop and use their leisure in ways that enhance their mental health, functional abilities, independence and quality of life" (National Therapeutic Recreation Society, 2000). Recreation therapy has roots in the clinical and medical arenas (Haun, 1966; Davis, 1952), but today practitioners also work in community settings with health protection and health promotion as a popular practice model (Austin, 1998).

Recreation therapists work with people with disabilities to assess their needs related to leisure, help strengthen positive attitudes toward constructive leisure time use and increase skills, knowledge, mental health and use of resources. This education and training is done to empower the individual to participate independently in recreation and leisure activities of his or her choosing. Recreation therapists aim to use leisure or recreation interventions to enhance people's quality of life through mental or emotional health.

Participation in healthy and constructive leisure should be an important and meaningful part of every person's life. Whether considered as free time away from work, a set of activities chosen for relaxation, recreation or enjoyment, or simply a 'state of mind' to which one escapes for peace or reflection, leisure is valued by people as an important feature of life. Leisure and recreation activities also serve as the primary means by which people come into contact with one another and form relationships.

Natural settings meet these conditions and are especially effective for promoting attention restoration. Brief experiences of nature in cities and towns can improve mental function and reduce mental illness. Encounters with nearby nature help alleviate mental fatigue by relaxing and restoring the mind. Within built environments parks and green spaces are settings for cognitive respite, as they encourage social interaction and de-stressing through exercise or conversation, and provide calming settings. Having quality landscaping and vegetation in and around the places where people work and study is a good investment. Both visual access and being within green space helps to restore the mind's ability to focus. This can improve job and school performance, and help alleviate mental stress and illness. Whatever internal or external factors have shaped our mental and emotional health, it's never too late to make changes that will improve your psychological well-being. Risk factors can be counteracted with protective factors in the form of leisure acts, like strong relationships, a healthy lifestyle, and coping strategies for managing stress and negative emotions.

The Challenge

Many people with psychiatric disabilities nonetheless find it difficult to develop physically or social active recreational and leisure pursuits for themselves:

Service providers are hesitant to regulate or dictate a person's free-time activities: the freedom to do what we want in our spare time is central to the very idea of leisure. So, choosing to watch television or simply do nothing is inherent to a person's right to self- determination. However, clients with serious mental illnesses may need help choosing recreational and leisure activities for themselves, especially if they have had these options for them in the past. While self-directed care ultimately involves choices, each choice should be based on informed decisions. It is often believed that it is relatively easy to find opportunities for a pleasant and socially creative pastime. Yet research shows it is not automatic, especially for people with mental illnesses. Just as such individuals can benefit from a job coach, they can also benefit from 'vacation coaching'. Leisure coaching will help them identify and explore personal values and interests that are associated with physically and socially active recreational and leisure activities, develop or refine the skills needed to pursue personal interests, and community recreation. locate individual and community resources to support their participation in Most importantly, leisure coaching will help remove barriers to participation in community and social life.

- Research has also shown that leisure behaviour is an important aspect of the coping response, yet few individuals consciously recognize the role that recreation and leisure play in helping them cope with stress or in their overall health and well-being. This is true for both individuals with serious mental illnesses and for service providers, such as case managers and peer supporters. This may inadvertently lead to undervaluing this aspect of a person's life.
- Finally, it may be that the health and human services system rarely sends the message that individuals with serious mental illnesses should take time off or have the opportunity to find health and happiness through physically and socially active leisure participation. Other important issues often take priority, and the commitment to creating an entertainment/leisure agenda can get lost in the shuffle.

RECOMMENDATIONS

The following are recommendations for service providers on improving recreational and leisure opportunities for people with mental illnesses:

- Create and evaluate model demonstration programs that use leisure coaching to promote proactive coping, community inclusion, life satisfaction and other positive outcomes for persons with serious mental illnesses;
- Involve peer supporters who can model positive leisure coping strategies;
- Train case managers to more specifically assess leisure coping beliefs and to include recreation and leisure as a focus;
- Develop and evaluate an annualized training

program to promote self-determination and proactive coping for persons with serious mental illnesses through recreation and leisure involvement;
- Develop and evaluate a annualized training program to increase environmental supports for recreation and leisure involvement, including self-advocacy and education for family and friends.

VII. CONCLUSION

People who are emotionally healthy are in control of their emotions and their behaviour. They are able to handle life's challenges, build strong relationships, and recover from setbacks. But just as it requires effort to build or maintain physical health, so it is with mental and emotional health. Improving your emotional health can be a rewarding experience, benefiting all aspects of your life, including boosting your mood, building resilience, and adding to your overall enjoyment of life. The positive characteristics of mental and emotional health allow us to participate in life to the fullest extent possible through productive, meaningful activities and strong relationships and also help us to cope when faced with life's challenges and stresses.

This article has explored the role of leisure and recreation in people's lives. Specifically, for people with disabilities, issues related to leisure have been described based on their impact on mental health. Diminished participation in leisure and recreation severely hampers a person's opportunity to acquire a positive self- concept and important social and interpersonal skills. Further, limited, or negative leisure experiences decrease chances for the formation of meaningful relationships. No matter how much time you devote to improving your mental and emotional health, you will still need the company of others to feel and be your best. Humans are social creatures with an emotional need for relationships and positive connections to others. We're not meant to survive, let alone thrive, in isolation. Our social brains crave companionship— even when experience has made us shy and distrustful of others. Social interaction — specifically talking to someone else about your problems — can also help to reduce stress. The key is to find a supportive relationship with someone who is a "good listener" — someone you can talk to regularly, preferably face-to-face, who will listen to you without a pre-existing agenda for how you should think or feel.

Leisure and how it interfaces with mental health is a very important part of quality of life. Recreation adds variety, enjoyment, and ample opportunity to make and keep friends. The role of leisure and recreational experience within the lives of people with disabilities is an essential part of a satisfying life and a primary pathway to love and intimacy in the most meaningful way. People who are emotionally and mentally healthy have the tools for coping with difficult situations and maintaining a positive outlook. They remain focused, flexible, and creative in bad times as well as good. Everyone is different; not all things will be equally beneficial to all people. Some people feel better relaxing and slowing down while others need more activity and more excitement or stimulation to feel better. The important thing is to find an activity that we enjoy and that gives us a boost.

Footnotes

- For a detailed discussion of the determinants of health see Statement on Preventive Practices and Health Promotion, CASW, March 1998, pages 2 - 4.
- This section and section 1.3 are taken from Mental Health for Canadians: Striking a Balance, pages 6 & 7.
- The following definitions are taken from Foundations for the Future: A Report of the Working Group on Child and Youth Mental Health Services, March 1990, page 8.

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The Archaeometallurgy of Vasantgarh, Sirohi, Rajasthan

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ABSTRACT

There are many disciplines within archaeometa llurgy which examines the production, usage, and consumption of metals from about 8000 BCE until the present. However, the scope of this research is limited to mining and metallurgy in the medieval industrial society of Vasantgarh. Many of the main themes of this literature do relate to current debates in anthropology, even though they were not written with an anthropological audience in mind. Besides working on the social construction of technology in capitalist economies at Vasantgarh, ancient archaeometallurgists were also involved in the social construction of technology in the kingdom. The slags and ores collected during the exploration of the Vasangarh fort site at Sirohi in Rajasthan were studied to understand the available minerals and their characterisation.

Keywords: vasantgarh, copper, zinc, brass hoards, jain sculpture, XRF, mediveal, silk-route trade, metallurgy.

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ABSTRACT

There are many disciplines within archaeometa llurgy which examines the production, usage, and consumption of metals from about 8000 BCE until the present. However, the scope of this research is limited to mining and metallurgy in the medieval industrial society of Vasantgarh. Many of the main themes of this literature do relate to current debates in anthropology, even though they were not written with an anthropological audience in mind. Besides working on the social construction of technology in capitalist economies at Vasantgarh, ancient archaeometallurgists were also involved in the social construction of technology in the kingdom. The slags and ores collected during the exploration of the Vasangarh fort site at Sirohi in Rajasthan were studied to understand the available minerals and their characterisation.

In this research, Chemical characterization of the slags and ores was conducted using Gravimetric analysis by vacuum fusion and X-ray spectroscopy; X-ray Fluorescence (XRF) spectrometry analysis to build a complete chemical element level test, which was conducted on a metal sculpture of Pindwara Jain temple, a part of 240 bronze hoard retrieved from the excavation from Vasantgarh. In this study, the presence of Zinc in the sculpture is reported, which is unique in understanding that sculpture hoards are not bronze but are brass that glitters like gold.

Keywords: vasantgarh, copper, zinc, brass hoards, jain sculpture, xrf, medieval, silk-route trade, metallurgy.

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I. INTRODUCTION

The history of world civilization is connected to the tale of the metals in antiquity in various different ways (Sharada Srinivasan, Srinivasa Ranganathan, 2013, p. 2). Mining and metallurgy have played crucial roles in the development of the world in every scenario (David Killick, Thomas Fenn, 2012, p. 560). The text of *Rasaratnakara* of *Nagarjuna* describes the method of production of zinc (Sharada Srinivasan, Srinivasa Ranganathan, 2013, p. 2).

In ancient India, the commonly used eight metals in antiquity are- gold, silver, copper, iron, tin, lead, zinc and mercury (Sharada Srinivasan, Srinivasa Ranganathan, 2013, p. 2). The minerals and metals tradition of India covers a time of over ten thousand years and extends beyond the current national boundaries of the Republic of India (Sharada Srinivasan, Srinivasa Ranganathan, 2013, p. 1).

As per Indian history, Copper was widely used in India from the 3rd to 4th century BCE, as found in the accounts of the Greek ambassador Megasthenes' visit to India in 302 BCE (Aditya Prakash Kanth, Rajdeo Singh, Buddha Rashmi Mani, 2022, p. 226). In our research, we have found significant metal antiquities from Sirohi and copper-ore mines from the site of Vasantgarh. Based on the scientific analysis, we can undoubtedly say that the copper industry of Vasantgarh had trade links with Zawar. Zinc had been popular in India before the common era, around the 4th to 5th century BCE, being the oldest evidence of the Zinc Industry (Kharakwal, 2011).

A great quantity of copper and bronze sculptures found at similar excavation sites are on display in museums or temples, as an evidence of the practice of using copper to produce different implements after extracting it from its ores.

The western state of Rajasthan (Land of Kings) is the largest state of India which can be divided into nine cultural regions; one of the nine regions is the *Godhwar* or *Gorwar* (cradle) treasuring a rich heritage relating to archaeological antiquities and history of Kings, temple art and architecture and large defence structures from our past (Talesara, Priyank; Bahuguna, Aniruddh, 2020, p. 14). The region is located to the southearn of Rajasthan state (Robbins, 2011, p. 193). Human habitation flourished in this district between the middle Palaeolithic to Mesolithic age and still continues (Thakar, Chintan; Patel, Punaram; Kharakwal, Jeewan Singh; Talesara, Priyank;, 2019, pp. 123, 124). The kingdom of Sirohi, lying in the *Godhwar*, was known as *Arbuda* - Mt. Abu, *Arbudanchala* or Mt. Abu kingdom - in ancient period.

The immemorial history of Rajputana (Rajasthan) was inclined towards business activities, having a greater significance accorded to the *Vaishyas* (trading class) and Jain folks, who controlled the sale and purchase of goods and commerce over communities (Taknet, 2016, p. 30). Due to the trade and role of the Silk-route, the prosperity of this area was glorified amongst the other cities of contemporary time (Talesara, Priyank; Bahuguna, Aniruddh;, 2020b, pp. 302,304).

In ancient-time, the site of Vasantgarh which is situated in the Sirohi District of the State Rajasthan was known for its copper mines and Zawar of Udaipur was an important industrial center of Zinc ore in the state. According to the Sun Temple inscription, Vasantgarh was under *Rajila*, the *Gurjara-Pratihara* king (under the feudatory of *Varmalata* of the *Chappa* dynasty) in AD 625. An inscription of AD 1042 also marked Vasantgarh as a province of the *Parmara* king *Purnapala* and later on, the dated inscription of fifteenth-century records the *Guhil* king *Maharana Kumbha* giving *Mandan* (the architect), the charge of re-establishment of a fort (Bhandarkar, 1907, p. 52). Vasantgarh is believed to be the abode of the sage *Vasistha* and there are many archaeological sites in Sirohi, which are connected with the folklore of sage *Vasistha* like *Vasantgarh, Vasa, Vastanji*, and *Achaleshwar* (Talesara, Priyank; Bahuguna, Aniruddh; Thakar, Chintan;, 2020, pp. 99, 100) ;Today it only has ruins of the fort.

The inscriptions found from this site belong to the 6th to late 15th century AD (Talesara, Priyank; Bahuguna, Aniruddh; Thakar, Chintan;, 2021, p. 5). Vasantgarh is also identified as *Basantgarh, Vatapura, Vata, Vatanagar* and *Vatakara* in different literary and epigraphical sources, wherein the term *"Vatakara"* is connected with the word *"Akara"* which means an important centre of mining and smelting (Talesara, Priyank; Bahuguna, Aniruddh; Thakar, Chintan;, 2021, p. 6). From this site 240 Jain bronze idols were found in the excavation which justifies the importance of the copper industrial workshop & also suggests that the site was well known for its trade & commerce, manufacturing large numbers of bronze idols (Talesara, Priyank; Bahuguna, Aniruddh; Thakar, Chintan;, 2021, p. 5). The inscription of Samoli (A.D. 646) is inscribed in the *Kutila* script using the Sanskrit language and informs us that - During the time of king *Siladitya*[1]*, a group of *Mahajana* community (caravan of merchants) headed by *Jentaka* who had migrated from *Vatanagara*[2]*, started mining at *Aranyakupagiri*[3]* for livelihood (Halder, 1933, p. 97). In the next line it is mentioned that *Mahattara Jentaka*, at the command of *Mahajana*, found the temple (*Devakula*) of *Aranyavasini* (goddess *Durga*), who was noted for her eighteen *Vaitalikas* (bards), hailing from different parts of the country and was always crowded with moneyed and wealthy people (Halder, 1933, p. 97). In AD 1452, the fortified city was under *Maharana Kumbha* but was later captured by the *Deora-Chauhan* King, *Rao Lakha* with the help of King Qutubudin of Gujarat (Talesara, Priyank; Bahuguna, Aniruddh; Thakar, Chintan;, 2021, p. 5). Vasantgarh has a similarity with the exquisite artistic beauty like that of the

[1] * Siladitya – Most of the scholars identified King Siladitya as belonging to the Guhil dynasty, whereas few scholars believe Siladitya VI of Valabhipura.

[2] * Vatnagara- It is the name of a place. Vatnagara is identified as copper smelting area of 'Vasantgarh' of Sirohi district.

[3] * Aranyakupagiri- Scholars believe it to be the name of the place of smelting & mining zone of Vasantgarh, mines of copper or Zawar mines of Zinc.

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sculptures of Akota bronze of Gujarat (P.shah, 1959, p. 1).

Our team tried to explore Vasantgarh, the ancient fort site of Sirohi. This research paper deals with the archaeo-metallurgical analysis of antiquities found during the field survey of the site Vasantgarh.

The area has not been geologically surveyed at the time, but we can say that there are numerous quarries near Abu and other places. Marble can be found near the ancient *Puskar tirthas*, as well as between *Utraj & Sheragaon* on Abu hill (Lala Sita, 1920, p. 13). It is an accepted fact that the celebrated Jain temples of Dilwara were somewhat fabricated of marble extracted from these quarries (Lala Sita, 1920, p. 13). The marble mines are also found on the hill of Achalgarh, named *Vansvalla*, and even good quality marble is also found at *Saliwara*, to the west of *Anadra*, *Serua* and *Perua*. Other minerals such as mica mines and arsenic, antimony, alum, sulphur, silver, copper and lead are available in several areas but in limited quantity. Quarry of gold was accounted in some ferruginous belt of quartzose schist close by the Rohera rail line stop in the year 1897 (Dhoundiyal, 1967, p. 17). The geomorphic study of *Godhwar* shows that the hills are highly eroded granite remnants of Precambrian uplift and divide the humid southeast from the arid northwest of the state (Robbins, 2011, p. 193).

The Aravallis besides bearing the flag for the oldest mountain range, is a twisted belt of the Proterozoic period entangled with the Archaean craton and it begins as a part of the state's eastern border.

For this research study - before field exploration- we gathered quantitative data from the archaeology and geography library. One of the important points jotted from the quantitative data is that around 1956 the local site of Vasantgarh was excavated for treasure-purpose - as per details from the ancient ruined Jain temple of *Shantinath*- in the vicinity of which were unearthed 240 bronze hoards of Jain idols, which were gifted to Pindwara Jain Temple (Shah, 1956, p. 55).

Apart from understanding the medieval metallurgy, the main aim and objective of this research is to lionize and exalt the grandeur and significance of the ancient industrial heritage of the site and to endorse to the admisitration and government, awakening them to acknowledge and safeguard the site from the unfaltering expansion and destruction due to modern mining and industrial activities.

II. METHODOLOGY

For the purpose of our goals and research, we have done an archaeological inquiry, which involved gathering quantitative data and also several field explorations of previously explored sites to discover new findings related to our subject. To determine the dates of the cities, the inscriptions were chronologically studied, various artifacts were collected for relative dating and finally concluded on the basis of observations related to the material culture of these cities, like- the brick size and the evolution of art and architecture. The information was further amalgamated with the discussions and interview of local people and conversations with an eminent historian. For a better understanding, we have used advanced technological applications such as QGIS, Google Earth Pro, Bing Map, Map-Hill and Measure Map software and other Geospatial applications which helped us generate quantitative data related to GIS studies, GPS location of the site, tracing geo-coordinates of sites and tracing MSL data of the sites.

The quantitative lab analysis method is used for archaeo-metallurgical tests; for metal element level testing XRJ laser Fisher SD 515 Advance Energy dispersive via X-ray fluorescence analysis measuring instrument (EDXRF), is used, to analyze precious metals and their alloys in composition and coating thickness; Petrographic examinations and Radical Titration methods with Ethylenediaminetetraacetic acid (EDTA) and redox reactions to establish the nature and composition of materials in a controlled environment of Analyst India Laboratory. The slags and ores collected during the exploration of the Vasangarh fort site at Sirohi in Rajasthan were studied to understand the available minerals and

characterization of raw ores and the slags. In this research, Chemical characterization of the slags and ores was conducted using Gravimetric analysis by vacuum fusion and X-ray spectroscopy.

For the qualitative purpose, we have collected the data from the library of, "Sahitya Sansthan Shodh Pustakalya, Udaipur", the Library of "University of Rajasthan, Jaipur", and other important online archives. Toposheets from "Survey of India" were used for help in the Pedestrian Survey of site location.

III. FINDINGS AND RESULTS

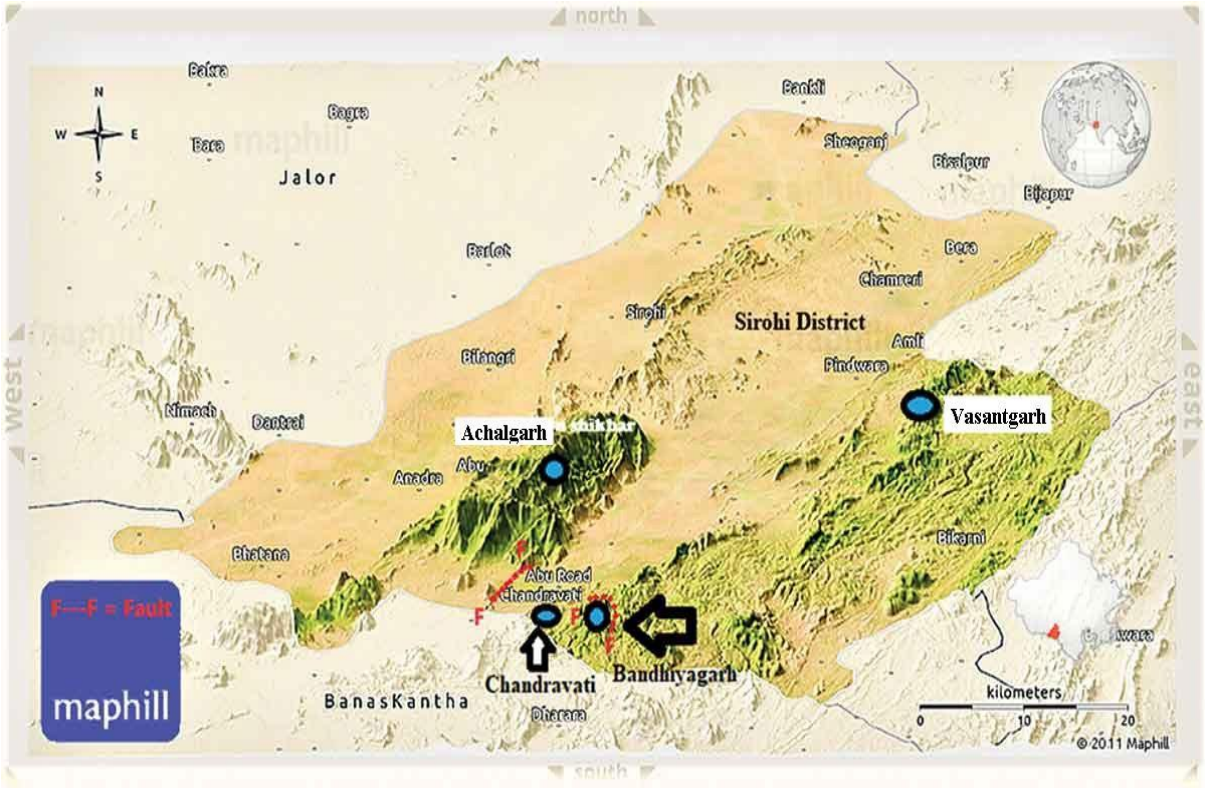

Figure 1: Topographical map of Sirohi District Showing Vasantgarh and other important locations

During the exploration, some slags and ores samples were collected to understand the archaeological data related to metallurgy. The inspection also yielded several sites of stony waste dumps that are also mentioned in the toposheet no G43T2 of the Survey of India indicating ancient mining activity. From the ancient times, *Mata* Temple of Hindu Goddesses are a common feature to be found around or nearby the mines symbolizing the goddess as the deity for safety during mining. In an interview with the priest of the *Ambaji* Temple, it came to light that the sculpture installed in the modern temple, was actually a part of an old mine, and was rescued by the local people who filled up the mine because of the risk of people, especially children falling inside.

All the slag activities and ore dumps are found near the West Banas River and the supporting tributaries, one site near *Khimel/Khimaj Mata* Temple, and several sites around *Ambaji* Temple. Some inactive modern mines are also found near the *Ambaji* Temple.

Figure 2: (A) Showing Chalcopyrite Sulphite ores of Copper, (B) Showing Malachite Carbonate Ore of Copper.

The Concentrated minerals of copper are broadly divided into sulphite, oxide, carbonate and copper silicate. The action of oxygen and water into oxides, carbonates and sulphites, is also conducive to smelting in pyrometallurgy (Kumar, 2021, p. 52). Such minerals bear eye-catching colors during the course of oxidation as the Brass Yellow color shown in Fig 2 (A) is Sulphite of Chalcopyrite having CU (Copper) 34.5% approx and the bright greenish color Shown in Fig 2 (B) is Carbonate of Malachite having CU (Copper) 57.3 % approximate.

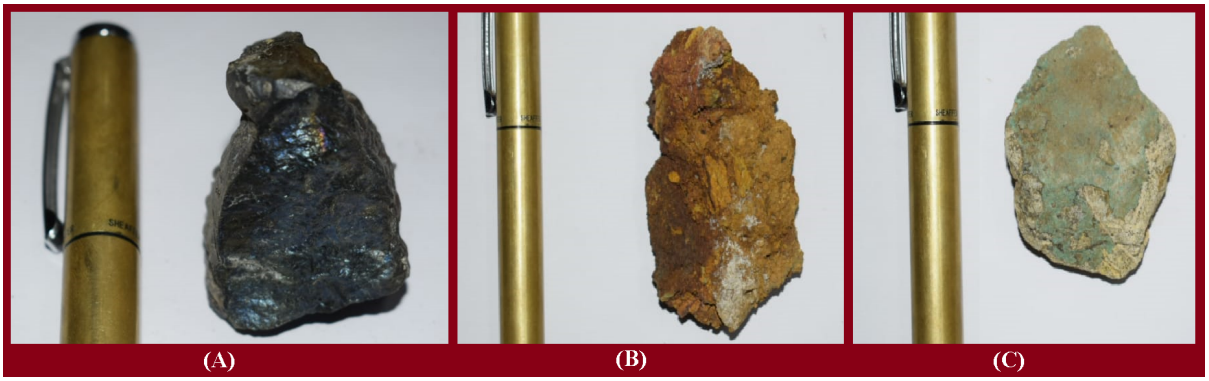

Figure 3: (A) Glassy Slag, (B) & (C) Ore Samples

One collected lump of slag was fine-grained, homogeneous and glassy in appearance. Because of the slag's dark color and glass-like appearance, it was slowly cooled in the open air and possessed a high specific gravity. Slag lumps like this one represent the first layer of slag produced during the smelting process. Fe and Si from 2FeO might have separated due to the high Ca concentration in granulated slag. CaO may also have increased the slag viscosity due to the greater amount of insoluble solids present, resulting in a better slag reduction at high temperatures, but higher Ca has been shown to reduce slag viscosity at high temperatures.

Other was rising micro bubbles caused matte entrainment in the slag by moving matte droplets onto the slag's surface. The matte entrainment due to the rising gas bubbles depends on two things: first the larger bubble buoyancy force than the matte droplet drag force, and then the thickness of the matte film. It is the bubble buoyancy force that lifts the matte droplets (Cheng X, Cui Z, Contreras L, et al, 2019). The above statement is presented in the equation below:

$$\frac{d_g}{d_{matte}} = \sqrt[3]{\frac{V_g}{V_{matte}}} > \sqrt[3]{\frac{\rho_{matte} - \rho_{slag}}{\rho_{slag}}}$$

(V_g and V_{matte} = the bubble and matte volumes; d_g and d_{matte} = the gas bubble and matte droplet diameters; ϱ_{matte} and ϱ_{slag} = matte and slag densities).

Since both bottom-blown and side-blown techniques were used in ancient Indian smelting techniques, likely, the matte was mechanically entrained from the smelting furnace.

The above-mentioned process of sulphur dioxide micro-bubble generation in settlement zone during matte phase is presented below:

$$CuFeS2\ (s) + O2\ (g) + SiO2\ (s) \rightarrow (Cu - Fe - S) \quad (l)$$

$$+ FeO - SiO2\ (l) + SO2\ (g) + heat \quad (2)$$

Below, gravimetric analysis by fusion methods, shows that most of the eye-catching bright color materials have copper traces; possibly the ancient copper mines exhausted from the upper accessible layers of that time. Also found traces of Aluminium oxide and Titanium in bright yellow Chalcopyrite material. The LOI in the table below is Lost in Ignition, one surprising ore of Iron is found, but the geology department has never reported iron from this area, so possibly, it travelled from other sites, as many other elements found in the XRF test of sculpture justify commercial trading of other elements from different part of the country as early as 7th century AD, which is also confirmed from the Samoli Inscription.

Table 1: Gravimetric Results of Samples taken from Site, Figures in Percent, BDL is below detection level

Sample Number	Type	SiO_2	CaO	MgO	Fe_2O_3	Al_2O_3	LOI	MnO_2	$CaCO_3$	$MgCO_3$	CU	TiO_2	Na_2O	K_2O
284/A/2022	Red Ochre	65.25	0.72	0.20	25.00	1.80	6.63	0.05						
284/B/2022	Slag	37.02	0.20	0.30	47.40	0.50	BDL	14.00						
284/C/2022	Slag	9.48	48.72	1.10	0.68	0.20	39.40							
284/C/2023	Slag						11		87.00	2.31	0.05			
1363/A/2022	Brass Yellow	78.04	1.20	0.20	11.90	4.70	3.6				0.05	<0.01	0.10	0.10
1363/B/2022	Green Stone	5.26	50.90	1.30	0.55	0.12	41.40			2.73	0.05		0.12	0.10

Figure 4: Photography is prohibited in Jain Temple. Here are some sketches of samples of Sculptures found in the excavation from Vasantgarh

The bronze sculpture art of Vasantgarh uses one of the most important ancient techniques called the Lost Wax method. The other important metal joining processes are subject to a more profound archaeometallurgical research, ie. Riveting, brazing, brazing flux, welding and soldering. The Vasantgarh school of art is connected with the industrial production of Metal sculptures that glitters like gold, which is evident from 240 metal sculptures recovered from the unauthorized excavation. All recovered sculptures are related to Jainism (Merchant class floks), this also shows that the region had a prosperous trade and commerce, which is why the city was designed defensively and is consistent with the number of forts and watch-towers to keep the kingdom safe from robbers and other hostile kingdoms.

XRJ laser Fisher SD 515 Advance Energy dispersive via X-ray fluorescence analysis is used to analyze a Lord Parashvnath Jain Trithankar sculpture from Vasantgarh Hoards. We had to perform two different tests for this sculpture because other than the main body there are several riveting metal points pasted to beautify the sculpture and these minor riveting metals are precious and rare in nature.

A combination of Zinc and Copper found in the main body is the major reason that their sculptures shine like gold; Gold and Irridium rare and precious trace metals which are also present in the beautification features. The available Zinc surely belongs to the ancient Zawar Mines of Udaipur, and Copper is natively available in Malachite and Chalcopyrite forms of Carbonate and Sulphide. Silver with other trace elements is present on the eyes, serpent hood ring, kite on chest and Padma seat, this Silver source is still a question mark and other trace elements are possibly accidentally mixed in the smelting process.

Table 2: XRF result of Metal Sculpture from Vasantgarh School of Art, Value in Percent

Sculpture Part	Siver	Copper	Zinc	Nickel	Iron	Lead			
Main Part	0.103	87.64	10.63	0.089	0.606	0.931			
	Gold	Silver	Copper	Zinc	Nickel	Lead	Irridium	Cadmium	Iron
Additional Riveting pieces	0.737	84.52	13.17	0.722	0.224	0.528	0.104	0.201	0.226

In addition, an intriguing petroglyph was found at the high valley on the left side of the main fort. The medieval carving of the face of a warrior (See Fig 5) is possibly carved through a very strong and sharp iron object that shows their expertise in metallurgy to make weapons. Iron ore present in dumps confirm that they were not only expert in sculpting but also making weapons for war and other utilities.

Figure 5: Petroglyph of Warrior Face craved on Green schists stone

IV. CONCLUSION

Analytical results clearly indicates to the reducing conditions in the smelting process, since dominant mineral phases are present in the sample. Furthermore, the presence of iron in higher concentrations confirmed the existence of a reducing atmosphere. By the gravimetric analytic method, calcium in higher concentration was detected in the granulated slag, which showed a dolomite structure. Based on the EDTA Radical test results, copper has a very low weight percentage in slag, indicating a very strong ancient smelting process pointing towards a highly efficient extraction process. Silica appears to have been used as a fluxing material along with a glassy phase in the slag as a result of the flux, which may have been helpful in efficiently separating the copper from the slag. The slag test also represents the presence of some other metals and minerals such as aluminium, titanium, etc. The slag was also cooled slowly, which made it impossible to recover iron.

The presence of Zinc in the XRF test on sculpture shows that sculptures are Brass hoards, not Bronze hoards as coined by previous scholars and in comparison to Akota Bronze. The riveting of different metals of varying melting points is still very difficult with modern science, and the fine soldering is subject to a deep metallurgical research in this field.

Conflict of Interest Statement

The authors state that there is no conflict of interest.

Ethical Approval

The data used for the estimates do not include confidential information about individuals or communities that may raise ethical concerns.

Consent for Publication

The authors grant consent for the publication of this paper.

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Data Availability Statement

The data used in this paper is fully available and can be accessed upon request.

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From Humboldt to Wittgenstein–Linguistic Picture of the World

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ABSTRACT

In this paper is considered the linguistic approach to the problem of the relationship between a human being and reality. If in the Christian tradition language was given by God and God endowed human beings with the ability to name objects, then in the 17th century German speaking philosophers, following Descartes' turn to the ego, had changed this thought. Since Herder and Humboldt language has been considered not as a representation of reality, but as a representation of a human mind. These thinkers were the first who revealed the inseparable interdependence of human thinking and language, the influence of language on the socio-cultural lifeworld of human beings, and the role of language in the development of the world-view.

Keywords: language, world-view, reality, Weltanschauung, Sprachdenken.

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In this paper is considered the linguistic approach to the problem of the relationship between a human being and reality. If in the Christian tradition language was given by God and God endowed human beings with the ability to name objects, then in the 17th century German speaking philosophers, following Descartes' turn to the ego, had changed this thought. Since Herder and Humboldt language has been considered not as a representation of reality, but as a representation of a human mind. These thinkers were the first who revealed the inseparable interdependence of human thinking and language, the influence of language on the socio-cultural lifeworld of human beings, and the role of language in the development of the world-view. The second crucial phase in the linguistic turn to the attempt of description of reality was made in the first half of the 20th century by Wittgenstein. In his works he came up to the idea of language games, where language becomes an inseparable part of all human activities. Now language permeates the whole human lifeworld (or a form of life in Wittgenstein), and language helps humans to create a picture of the world. However, depending on different languages, language games and arrangements on the rules of these games, we come to the plurality of both the forms of life and of the picture(s) of the world. The surrounding reality is not only being constituted with and by language, but it plays an irreplaceable role in interpretations, explications, explanations, demystifications and understanding the physical structure, laws and patterns of the world around. Language is the primary and paramount way and instrument of communication between humans, it helps not only to describe and explain the reality, but to create new. This approach to language is not new, it has been developed since Leibniz's, Hamann's, Herder's, Wilhelm von Humboldt's works.

Keywords: language, world-view, reality, Weltanschauung, Sprachdenken.

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I. INTRODUCTION

The basic scheme of the human's linguistic interaction with reality in the triad *language – thought – world*. Humans are fully engaged in the *speech-world*. Language presents the world for us; it is our *window to the world*. Hatab (2017) in his book about the nature of language writes, that language inhabits and encompasses a "disclosive field," triangulated across "the individual-social-environing world," doing so, not timelessly, but with its own distinctive "temporal-historical structure" (Hatab 2017, 125–26, 129) and a distinctive embodiment in gestures and sounds; the "immediate presentation of meanings" in language, so construed, is the precondition of representational accounts (ibid., 130). This explanation and the following one are very close to the ideas of later Ludwig Wittgenstein and Wilhelm von Humboldt. Language is an instance of nature *intertwining* with culture, thereby accounting for the fact that language, fitted as it is to the *lived world*, is at once both conventional and cross-cultural (Hatab 2017, 142–43). Language and thought are inseparable in *life world*, we use speech for thinking, this process as well as meditation on something is impossible without language, thinking is an incorporation or internalization of speech.

The problem of the origin of language had not been not identified as a separate sphere of study in Europe until the 18th century among German-speaking thinkers. Before that time the *question of the origin of language*, the *problem of relationship between language and thought*, *relationship language and reality*, how *language represents reality*, were matters of philosophy, theology, while the other disciplines had not yet been strictly defined.

Before the 17th century the idea of nominalism was dominated in philosophy. Language was separated from actors, speakers. "Meaning by the seventeenth century has become almost entirely a property of words rather than deeds" (Tyler 1978, 167). Language was a gift from God[1] (Bible, Genesis 2:19)[2], so, the origins of words were studied in relation to things they named.

> (…) since language is the defining characteristic of our species, the choice of answer is intimately bound up with speculation about our nature and our works, about poetry, art, aesthetics, early civilization, society, and the foundations of culture. (Aarsleff 1986: 1).

Theologians claimed that the origin of language and speech is divine origin, the Divinity – God was the first teacher of humans. The latter hypothesis was modified by Johann Gottfried Herder (1744-1803). He believed that

> (…) language is neither so far above men that the Divinity should have been necessary to invent it for him, not so far below man that the brute should have been able to invent it. It is the necessary and conjoint result of sensibility and reflection, both of them acting upon the basis if man's natural organization and of his connection with the external world. It is his reflection that has converted the sounds of nature into significant signs, and invested them with a human element; and it is, again, his reflection which, in connection with feelings, has converted the forms and colors of the external world into sounds of speech. (Adler 1866, 14)

So, there is no one simple answer to the question of what the language is. It is not just a product of human physical organization (the speech – vocal apparatus), not only the result of arbitrary social convention. It is a special complex phenomenon, one of the distinctive characteristics of the human race. In general, Herder theory of language was much more poetical, than philosophical.

The theoretical foundations of the *linguistic turn* and study of philosophy of language were laid by Wilhelm von Humboldt). His theory of language as both mental and social action was the most thoroughly developed among his contemporaries: Hamann, Herder, Schlegel (McLuskie 2003, 34). Humboldt read Herder's *Essay on the Origin of Language* (*Abhandlung über den Ursprung der Sparache,* 1772), where Herder first wrote about the diversity of languages and cultural pluralism, that every nation (and corresponding culture) possesses its own identity. Herder focuses on the language as a special ability of human mind that distinguishes humanity from other species, and the creative capacity of language that produces human differences and diversity of cultures, "that language, from without, is the true differential character of our species as reason is from within" (Herder, 1966, 127). For Herder human mind and language are inseparable because they are both the manifestations of a single essential human characteristic. If before the 17th century language was understood as the re-presentation of the whole world, Humboldt's and his contemporaries' linguistic turn was in proposing to understand language as a representation of a humankind.

Humboldt's Sprachdenken

Wilhelm von Humboldt (1767-1835), as well as J. G. Herder, K. W. F. Schlegel, stood at the origins

[1] See Francisco Suárez, Spanish philosopher and theologian, one of the great scholastics after Thomas Aquinas, about 'the incarnation of the Word'- '*De Incarnatione Verbi*' (1590).

[2] Greek Septuagint καὶ ἔπλασεν ὁ θεὸς ἔτι ἐκ τῆς γῆς πάντα τὰ θηρία τοῦ ἀγροῦ καὶ πάντα τὰ πετεινὰ τοῦ οὐρανοῦ καὶ ἤγαγεν αὐτὰ πρὸς τὸν Αδαμ ἰδεῖν, τί *καλέσει* αὐτά, καὶ πᾶν, ὃ ἐὰν *ἐκάλεσεν* αὐτὸ Αδαμ ψυχὴν ζῶσαν, τοῦτο *ὄνομα* αὐτοῦ. (my italics and bold) King James Version (English translation) And out of the ground the LORD God formed every beast of the field, and every fowl of the air; and brought them unto Adam to see what he *would call* them: and whatsoever Adam *called* every living creature, that was the *name* thereof. (Italics and bold by me.)

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of modern linguistics (Forester 2011). But they were not the first thinkers who drew attention to the theoretical comprehension of language and its inextricable connection with the human mind and total life. Their work constituted the earliest modern linguistic turns in philosophy; however, this phenomenon is usually related to the following century (McLuskie 2003; Rorty 1992; Wellmer 1974).

Linguistic skepticism and detection of limits of language, on the whole, can be traced back to Humboldt, Herder, Schlegel, Hamann, Weisgerber, through Romanticism and French Symbolism, through genesis of Austrian linguistic philosophy at the turn of the 19th and 20th centuries, Sapir and Whorf and American linguistics and philosophy of language, up to modern times.

Wilhelm von Humboldt was the first who used the term 'philosophy of language' in 1793, arguing that language is evidence for the spirit and charter of people speaking it. We can know much about the spirit and life of ancient Greeks from Ancient Greek language, we can trace foreign inflections and constructions in language, and thus know about their interactions with other nations (Humboldt GS I, 263-5). Humboldt discussed questions not only concerning the "(…) origin, the definition, the essential nature of language, (…) the formation of roots, words and grammatical form", but one of the first discussed "the organic principle and character of language, the idea of language, (…); and finally, the development of language in history, and its relation to the latter" (Adler 1866, 13).

Aarsleff (1999, xxvi) suggested that Humboldt combined his linguistic interests and Kantian problem of the relation between reason and sensibility in experience. Reason here was understood as mind's spontaneity and sensibility as a receptivity. For Aarsleff Humboldt's philosophy of language is a product of synthesis of "Kantian concerns about the proper unity of reason and sensibility in the constitution of experience and Condillac's and *idéologues'* focus on the union of concepts and language" (ibid., xxvii). Humboldt wrote in 1798 "my stay in Paris is making a (new) epoch in my thinking" (Humboldt 1840, 62). He synthesized the following ideas in his own theory: (1) "the idea that representation is (…) a product of mental activity and mind's receptivity;" (2) "the idea that the external linguistic sign contributes to the synthesis of the manifold of intuition to produce a representation." (ibid.)

Humboldt's approach to the study of language, against, was scientifical. He did not support the theory of the Divine origin of language. In his letter to Rémusat he expressed against direct divine intervention, the human speech is originated by the '*génie inné à l'homme pour les langucs*' (Humboldt Werke, Vol. VII, 337).

He thought that language could not be invented, because language is an integral part of human nature, a human has a general capacity for speech. He wrote: "that language could not be invented unless its type already pre-existed in human intelligence." Also, "that man is a man, (*i.e.* a human being) only in virtue of speech, and that consequently to invent speech he would already have to be one" (Humboldt Werke Vol. III, 252-258). It resides in every human being (Humboldt 1999b, xii).

Humboldt was one of the first linguists and philosophers who drew attention to the national content of language and thinking, noting that different languages are the organs of their original thinking and perception for the nation. Humboldt came to look upon each language as an organism, all its parts bearing harmonious relations to each other, and standing in a definite connection with the intellectual and emotional development of the nation speaking it. These ideas dominated the romantic theory of language. „Die Idee der Sprache als eines dem Menschen wesentlichen Organs der Wechselwirkung beherrscht die gesamte romantische Sprachtheorie" (Müller-Vellmer 2018, 305). Each language bears the relation to language in general that the species does to the genus, or the genus to the order, and by a comprehensive process of analysis he hoped to arrive at those fundamental laws of articulate speech which form the *Philosophy of Language*, and which, as they are also the laws of human

thought, with those of the *Philosophy of History* (Brington 1885). "Humboldt used language as a tool to study the human mind and interpret human cultural difference" (McNeely 2011, 131). While language is never a word of an individual, it is the product and the property of the entire nation.

Language for Humboldt was 'the animatic breath' (Humboldt 1999b, 44), the 'formative power (…) in the act of altering the world' (ibid.). Humboldt considered language as an 'intermediate world' between thinking and reality, while language captures a particular national worldview. Language is a medium or a link of communication. The external world becomes converted into internal by the act of speech. Adler (1866, 16) writes that thus language is a *perpetual prosopopoeia*, in other words - never-ending personification. Language as a totality is an intellectual world and constitutes a medium (a sort of the'middle ground' (ibid.) between human and nature (external). So, it is a medium of communication not only between individuals, but between an individual and nation, between the past and present.

Humboldt emphasized the difference between the concepts of the intermediate *world* and the *picture of the world*. The first is a static product of linguistic activity that determines the perception of reality by a person. Its unit is a 'spiritual object - a concept. The picture of the world is a mobile, dynamic entity, since it is formed from linguistic interventions in reality. Its unit is a speech act. Humboldt was the first who outlined the constitution of reality with language. He considered language as the eternal labor of the mind.

Considering new languages Humboldt discovered an architecture of language, its inner structure – *innere Sprachform* – 'the deep structure of language' (Turner 2014, 135). Humboldt showed how this *innere Sprachform* of a language 'manifests the inner life and worldview of a people and how this *Sprachform* in turn shapes the spirit in conveys' (ibid., 136). Humboldt used the term *inner language form* in a few occasions (M.-E. Conte 1976, 617) in his prominent book *Über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluss auf die geistige Entwickelung des Menschengeschlechts* (Berlin: F. Dümmler, 1836)[3]. Either Humboldt did not provide any strict definition of this term, Steinthal, his disciple (1860, 242), wrote that Humboldt just 'suspected' the meaning of the 'inner form'. Other scholars tried to formulate a definition of this 'inner form'.

> It seems clear that von Humboldt's 'innere Sprachform' is the semantic and morpho-syntactic structure of the given language (…). (Salus 1976, 98)

> Humboldt's *innere Sprachform* is the semantic and grammatical structure of a language, embodying elements, patterns, and rules imposed upon the raw material of speech. (Robins 1979, 175)

Humboldt wrote that,

> (…) the concept of language form stretches beyond the rules of syntax and even beyond morphology, inasmuch as by the former one understands the application of certain general logical categories…on the roots and stems themselves. (Humboldt 1999b, 69)

So, the concept of language form itself does not relate neither to semantic nor to grammatical structure of language. This inner form can be detected only through the structure of language. Language is linked with the human mind inextricably. Humboldt claimed that language is the 'ever repeating work of the psyche to make the articulated sound capable of expressing thought' (Humboldt 1999b, 56). According to Humboldt, language is the basis not only of human thinking or reason, he used the phrase *menschlichen Geistes*[4]. Humboldt thought that there is a special

[3] There are different English translations of the title of this book: '*On language: the diversity of human language-structure and its influence on the mental development of mankind*', trans. by Peter Heath, introduction by Hans Aarsleff, Cambridge, New York: Cambridge University Press, 1988. '*On language: on the diversity of human language construction and its influence on the mental development of the human species*', ed. Michael Losonsky, trans. by Peter Heath, Cambridge, New York: Cambridge University Press, 1999b.

[4] „Der Zweck dieser Einleitung, die Sprachen, in der Verschiedenartigkeit ihres Baues, als die notwendige

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mental power '*Geisteskraft*', and this power is responsible for language and cultural diversity (Aarsleff 1999b, xi). This word *Geist* has a wide field of meanings, depending on the context, we can translate it as spirit, mind, intellect, psyche. Thus, language affects all parts of human life as a human, and a perfect language affects the spirit in all directions: „allseitig und harmonisch durch sich selbst auf den Geist einwirken" (Gesammelte Werke, Bd. Iv, 311). Further in my work I will use this word *Geist* without translation when it is necessary to define in one word the sphere of the spiritual and intellectual life of a human. Also, Humboldt said about language, that it is the *organ* which forms a thought. „Die Sprache ist das bildende Organ des Gedankens" (Gesammelte Werke, Bd., vi, s. 51). He claimed that the structure of every language reflects the mental characteristics of the nation that generated it (Turner 2014, 135). The form of language correlates with the national character of people speaking this language. Language is a kind of mirror into a culture, socio-cultural features of a nation, into the way of thinking of people using a certain language. Within language speakers agree with each other on the meanings of the words and structures of sentences. Language is like a reflection in the mirror, it reveals the history of nations; comparing the evolution of languages shows the corresponding progress of civilisations using those languages. Also, in turn, language is an action or a kind of human labor.

> (…) it is produced by states that are internal to the mind, for example feelings, desires, beliefs, thoughts, and decisions. These internal mental states are active powers or forces that bring about the external phenomena of culture, including human language. (Aarsleff 1999b, xi)

Humboldt in his *Verschiedenheit des menschlichen Sprachbaues* most clearly stated the hypothesis of J. G. Herder, that language and thought are inseparable, each conditions the other, every nation has a specific spirit expressed in its language (ibid., 136). Language is inextricably connected with human intellect. There is a kind of symbolic relationship between language and intellect, 'whereby without language there would be no intellect and without intellect there would be no language' (Trauth 1989, 411). Humboldt wrote in the chapter on 'inner form' in *Verschiedenheit des menschlichen Sprachbaues* (ibid., 104-114) about the laws that direct mental activity of a human and govern and systematize both intellect and language. The major part of systematization is categorization. Humboldt did not write in detail about categorization unlike Kant for whom this topic was one of the central in his system of philosophy. I will write about the role of language in Kant's transcendental schematism further.

One of the main Humboldt's hypotheses was that due to the relationship and connection between language and intellect people do think differently using different languages. This hypothesis has been revived by some cognitive scientists nowadays (Deutscher 2010, Boroditsky 2010). He wrote about the special laws, and in language the human intellect operates according to these laws, speech itself is a product of rational instinct which nature is the human reason (Humboldt, see: Werke, Vol. II: 240, Vol. III, 253). And speech plays a central role in a sign-producing process, it matches the segmentations of thought with articulations of sound. Language is a product of the intellectual instinct of man (Adler 1866, 15).

Either, Humboldt's studies of language anticipated modern communication studies-communication theory of society or theory of communicative action (McLuskie 2003). Wittgenstein in his middle Cambridge period in the *Brown Book* spoke of different language games as 'systems of communication' (*Systeme menschlicher Verständigung*).

For Humboldt language was not an isolated object, it was connected with an intellect (and in some way conditioned the way of thinking), it conditioned and opened up historico-socio-cultural world of a nation for others and for people of this nation. Later Heidegger continued

Grundlage der Fortbildung des menschlichen Geistes darzustellen, und den Wechsel seitigen Einfluss des Einen auf das Andre zu erörtern, hat mich genötigt, in die Natur der Sprache überhaupt einzugehen." (Humboldt, *The Philosophical Grammar of American Languages*, 1855, vi, S. 106)

this work painstakingly analyzing the hidden meanings of words hidden in the roots and prefixes, since the language matures in itself the ancient history of a nation. Language is an activity itself; it is not just a system of mental objects. First of all, language for Humboldt was an object of scientific study, but he believed that there is always still part of language that escapes scientific understanding. Our attempts to explain socio-cultural and linguistic phenomena from time to time run into knots that resist further resolutions. These knots are mental powers, which 'can neither be wholly penetrated in (their) nature, nor calculated beforehand in (their effects)' (Humboldt 1988, 23). Science cannot fully understand language, because what the science understands is a finished product, it is 'abstraction' or 'dead contraption' (Humboldt 1988, 49-50). Language, instead, is not static, finished, it is not a product (*ergon*) but an activity (*energeia*) (ibid.). It is a living production because it is a product of human intellect. Also, language cannot be understood fully scientifically because of the part of freedom. Language is an involuntary activity but it is also the creative activity, inasmuch as human mental power to speak is free (Humboldt 1999b, xii), but nor absolutely, it is not free of all compulsion. As it was written above, according to Humboldt language and human intellect obey special laws. And the latter allows us to study language by scientific methods. This intellectual power, that generates language consists of 'special laws of procedure or directions or endeavors' (Humboldt 1988, 90). Humboldt calls these laws 'the form of language' (Humboldt 1999b, xiii; 1988, 50). For Humboldt the form of language consists of two main parts: *the external (sound) form* and *internal (intellectual) form*. These two parts constitute the individual form of language (Humboldt 1999b, xiii). The first sound form is the 'truly constitutive and guiding principle of the diversity of languages' (ibid.). The internal part, also, consists of two parts: *the inner conceptual form* and the *inner linguistic form*. Human mind (or here intellect) is a system ruled by special laws, concerning the inner conceptual form these are 'the laws of intuiting, thinking and feeling as such', 'they are the universal *forms of intuition* and the logical ordering of concepts' (Humboldt 1988, 81; see 84). Unfortunately, Humboldt did not provide the system of these laws. Nevertheless, he provided diverse examples of these laws concerning different aspects: predication, conjunction, modality, spatio-temporal relations. The second part – inner linguistic form consists of laws that help to express the mind's concepts and its inner conceptual form in language. These laws are common for all human beings. Although the inner conceptual and linguistic forms are universal, languages are diverse. It is possible due to 'the unpredictable, immediately creative advance of human mental power' (Humboldt 1836, 33). Language for Humboldt, to the greater extent, is a work of art (Aarsleff 1999b, xiv). On the one side, language is governed by rules (laws), on the other side, it 'cannot be measured by the understanding', and this 'free', 'creative' dimension of language is 'the deepest and inexplicable part' of it (see: Humboldt 1836, 108,119; 1988, 81, 89).

Humboldt broke with logocentrism dominated earlier, which was in Habermas' words 'the *ontological* privileging of the words of entities, the *epistemological* privileging of contact with objects or existing state of affairs, and the *semantic* privileging of assertoric sentences and propositional truth' (Habermas 1998c, 408, italics in the original). Humboldt was one of the first philosophers who considered language in an inextricable connection with the human lifeworld. "And that units Humboldt with late Wittgenstein and Austin" (ibid.) He provided a challenge to the Cartesian view on language (see: Chomsky 2009; Aarsleff 1982). Habermas (1998, 40) claimed that Humboldt's analysis of language allows us to say that 'Language, world view and form of life are interwoven.' In Humboldt's words: 'language is indispensable for the development of their mental powers and the attainment of the world-view' (Humboldt 1999, xi). It is better to say that a language is a product of individual life-worlds that in total compound it.

Returning to the main topic of my article, it is important to note that for Humboldt language determines how humans think. Along with the idea of the diversity of languages, the idea of

language determination of human thought underlies modern linguistic relativism. Contemporary linguistic relativism has been typically associated by researches with works of linguists Edward Sapir and Benjamin Whorf (their hypothesis of linguistic relativity), and with later Ludwig Wittgenstein (Sayers 1987; Haller 1995; Williams 2007; Coliva 2010a, b; Heckel 2010). Returning to Humboldt's ideas on the relation between language and thought, we can notice that the idea of linguistic relativity and the determination of thought on language is traced to his writings. Humboldt wrote that language is a necessary condition of human thinking, it is the 'formative organ of thought' (Humboldt 1988, 54, 56). One of the main points of this dependance is a sound. Humboldt explains that without sound human process of thinking cannot achieve clarity. Without sound the representation (*Vorstellung*) will not become a concept (*Begriff*). These mind's representations are products of inner mental activity. The sound of language helps to take these representations from the mind (from the subjective) and transform it into an object (real objectivity). So, with sounds thoughts as products of inner mental life become objective. It is a way to transform inner into outer, subjective becomes objective. Not all mental activity necessarily implies articulation and reproduction in the form of sounds, Humboldt allows the existence of the process of thinking without the participation of language. But the formation of concepts – 'true thinking' is impossible without language and objectivation of the internal mind's representations by sounds. Cognitive thinking (involving judgment) fully depends on speech. One of the most important functions of language is designating objects. While perceiving objects without language 'there can be no object for the mind' (Humboldt 1988: 59). Language designates objects and makes concepts. Without notion of concepts our perceptions and objects of our perceptions and unknown. For example, we perceive an object, in language we designate it as a cat. Imagine, we do not have language, what would we see? It is very difficult to imagine something and not to use any concepts at all. We are so involved in language, got used to use concepts automatically. Describing a cat, we will use: cat, four, legs, two, eyes, ears, one, nose, small, animal, black, stripes, even an object or something, etc., all these words are concepts. It is a rather deep idea. Objects we experience are possible for our cognition and mind only by language. Only language makes concepts for the mind. As well, humans categorize and classify the concepts in a thought. Languages are both ruled by common laws and are diverse in their structure, and they are necessary for human cognition. So, in every language resides a characteristic world-view (*Weltansicht*[5]). Each language creates its special world-view. Each nation speaking one language has a common world-view, that distinguishes it from the world-views of our nations speaking their own languages. 'Languages are bound and dependent on the nations to which they belong' (Humboldt 1988, 24). Humboldt believed that to learn a new language is 'to acquire a new stand point' (Humboldt 199, xvii), it expands the horizons of knowledge and world understanding. The new world-view is superimposed on the previous world-view learned from childhood.

It should be noted that among Humboldt's ideas on language there are two that Wittgenstein singled out in his later works. Language constitutes a world-view or a picture of the world. And the second one is that it is impossible to understand the world of a non-human, because non-humans do not have language that is governed by human's mind, they do have other kind of mind (or do not have it at all, only simple organs of perception), and so they have other form of life and the following picture of the world. In *PI* §327 (2009) Wittgenstein wrote: 'If a lion could talk, we wouldn't be able to understand it.'

Wittgenstenian linguistic turn

The role of language in the constitution of reality in late Wittgenstein's philosophy is not well

[5] Humboldt used the word '*Weltansicht*', not '*Weltanschauung*'. Both of them are translated into English as '*worldview*'. They are similar, but there is a fine distinction in senses. In the first term the second part of the word is '*Ansicht*' – a point of view or view. In the second word the second part is '*Anschauung*', it is a basic opinion but not just a point of view. Collins dictionary gives a definition that '*Weltansicht*' is a '*view of the world*' and '*Weltanschauung*' is a '*philosophy of life*' or '*ideology*'.

disassembled and analyzed in the works of researches of Wittgenstein's philosophy. There are numbers of outstanding works of separate Wittgenstenian concepts: language games, forms of life, belief, family resemblance and the others, there are numbers of comparative analyses of Wittgenstein's ideas and thoughts with concepts and ideas of other philosophers. But there is, yet, no full analysis of Wittgenstein's representation of the process of constitution of reality and the role of ordinary language in it.

The origin of *linguistic turn* in the 20th century is associated with Wittgenstein's *Tractatus Logico-Philosophicus* (Glock, Kalhat 2018), where Wittgenstein argued that philosophical problems arise from the misleading of language (misleading of its logic). However, Michael Dummett (1991) considered it to be dated to Gottlob Frege's idea that words have meaning only in the context of proposition, expressed in Frege's *Foundations of Arithmetic* (*Grundlagen der Arithmetik*, 1884) as a *context principle*.

> In the enquiry that follows, I have kept to three fundamental principles:
>
> always to separate sharply the psychological from the logical, the subjective from the objective;
>
> never to ask for the meaning of a word in isolation, but only in the context of a proposition;
>
> never to lose sight of the distinction between concept and object. (Frege 1960, xxii)

Wittgenstein repeats Frege's context principle in Tractatus 3.3 and 3.314.

> 3.3 Only the proposition has sense; only in the context of a proposition has a name meaning.
>
> 3.314 An expression has meaning only in a proposition. Every variable can be conceived as a propositional variable. (Including the variable name.)

Frege's approach to the logic of propositions and their relations to facts was continued by Bertrand Russell in essay *On Denoting* (1905) and later developed in his concept of *logical atomism*.

The term *linguistic turn* was popularized by Richard Rorty in his anthology *The Linguistic Turn* (1967). According to Rorty (1991) this term was introduced by Gustav Bergmann in 1960[6] and was described as 'the most recent philosophical revolution,' (Bergmann 1964, 177) as it was proclaimed by A. J. Ayer et al. in the book of the same name, it is a *new way of seeing*. However, Rorty (1967, 8f) related to linguistic philosophers (and the participants of this revolution in philosophy) not only Wittgenstein, but a large group of thinkers: the members of Vienna Circle, Wittgenstein and his followers, Oxford philosophers, and some American linguistic philosophers, including Quine. These thinkers advocated two different approaches to solve philosophical problems. One group – 'ideal language philosophers' proposed to reform language, the other group – "ordinary language philosophers" proposed to understand more about the ordinary language that we actually use (Hacker 2005, 10).

It should be noticed that Bergmann was himself a member of the Vienna Circle and regularly attended its meetings in the late 1920s and in the 1930s (Hacker 2013). It is difficult not to agree with Ernst Gellner, despite his negative intent, that it was one of the crucial turns in philosophy, and the most significant in the last 100 years.

> It has often been said that man in the past saw nature and God, in his own image. It now also appears that he saw things in the image of his own language. So, the overcoming of logomorphism supplements the overcoming of anthropomorphism. (Gellner 1959, 27)

I agree with Bergmann, that Wittgenstein was the originator of the *linguistic turn*[7] and its most influential and interesting spokesman. Hacker (2005, 11), analyzing the origin of the *linguistic turn*, suggested that it was taken when the following statements were proposed:

[6] In Bergmann's critical review of P. F. Strawson's book '*Individuals*' (1959). Bergmann, G. (1960). Strawson's Ontology. The Journal of Philosophy, 57(19), pp. 601–622.

[7] Subsequently W. V. O. Quine and Saul Kripke continued the mainstream analytical line of this linguistic turn.

- That the goal of philosophy is (a) the understanding of the structure and articulations of our conceptual scheme, and (b) the resolution of the problems of philosophy (to be specified by paradigmatic examples), which stem, inter alia, from unclarities about the uses of words, from covert misuses, and from misleading surface grammatical analogies in natural languages.
- That a primary method of philosophy is the examination of the uses of words in order to disentangle conceptual confusions.
- That philosophy is not a contribution to human knowledge about reality, either superior to or on the same level as scientific knowledge, but a contribution to a distinctive form of understanding.

Hacker, also, agreed with Bergman, that the linguistic turn had been originated by Wittgenstein since *Tractatus*. On the other side, Dummett (1978, 458) and Williamson (2005, 107) attributed the linguistic turn to Frege and his works.

> Only with Frege was the proper object of philosophy finally established: namely that the goal of philosophy is the analysis of the structure of *thought*; secondly that the study of *thought* is to be sharply distinguished from the study of the psychological process of *thinking*; and, finally, that the only proper method for analysing thought consists in the analysis of *language*. (...) the acceptance of these three tenets is common to the entire analytic school. (Dummett 1978, 458; italics in the original)

Hacker argued that Dummett's articulation was mistaken. Frege did not express such views, he did not have special views on the philosophy of mind, psychology, ethics. Moreover, Frege did not support the position that the only proper way of analyzing the thought (*Gedanke*) is by analyzing natural language (Hacker 2005, 12). In his letter to Husserl, Frege claimed:

> It cannot be the task of logic to investigate language and determine what is contained in a linguistic expression. Someone who wants to learn logic from language is like an adult who wants to learn how to think from a child. (Frege 1980(1906), 67f)

According to Frege there was a proper method to analyze thought by means of the function-theoretic concept-script that he invented (Hacker 2005, 12).

The linguistic turn increased focus on logic and philosophy of language, Wittgenstein changed our *way of seeing* of many aspects of our knowledge and ordinary life. Despite the modest phrases from the notes of 1931 (Wittgenstein *CV* 1980, 19[e]): 'I don't believe I have ever *invented* a line of thinking. I have always taken one over from someone else. (...) What I invent are new *similes*' (italics in the original). Wittgenstein tried to change the style of thinking of his pupils. Unfortunately, as von Wright (1955, 542) noted, that Wittgenstein's enormous influence as a teacher was 'harmful to the development of independent minds in his disciples', and 'there grew up much unsound sectarianism among his pupils', which 'caused Wittgenstein much pain'. 'Because of the depth and originality of his thinking, it is very difficult to incorporate them into one's own thinking' (ibid.). However, in the Preface to *Philosophical Investigations* Wittgenstein hoped 'to bring light into one brain or another' (2009 (1953), 4[e]).

In the collection of notes from his lectures written down by his students entitled *Lectures and Conversations* we can find the following call:

> 40. How much we are doing is changing the style of thinking and how much I'm doing is changing the style of and how much I'm doing is persuading people to change their style of thinking.
> 41. (Much of what we are doing is a question of changing the style of thinking.) (1967, 28)

In the *Philosophical Investigations* Wittgenstein called us 'Back to the rough ground!' (PI 2009, 51[e], §107). Wittgenstein wrote:

> There is nothing absurd in the thought that the age of science and technology is the beginning of the end of humanity, and that

> humanity, trying to make its way into the future, relying on scientific rationality, is trapped. (Wittgenstein CV 1980, 63)

In my research I make an attempt to analyze and describe this change in the 'way of seeing', offered by Wittgenstein in concern with the concept of constitution, how a human constitutes the world around with the help of language. What is the relationship between language and reality, in accordance with Wittgenstein's late ideas? Also, I should define what was the previous *way of seeing* which Wittgenstein has changed and what was his change itself. And was Wittgenstein's philosophy metaphysical?

> The concept of perspicuous representation is of fundamental significance for us. It earmarks the form of account we give, the way we look at things. (Wittgenstein PI 2009, §122) (Is it similar to *Weltanschauung*?)

This interesting passage and, especially the end of it '*the way we look at things*' resembles Husserl's '*attitudes of consciousness*' and *Weltanschauung*. Also, Wittgenstein used a concept *Weltanschauung* describing our (human) form of representation, the way how we look at things in the manuscript TS 213 in a part entitled *Methode der Philosophie: die übersichtliche Darstellung der grammatischen Tatsachen. Das Ziel: Durchsichtigkeit der Argumente. Gerechtigkeit. (The Method of Philosophy: the Clearly Surveyable Representation of Grammatical1 Facts. The Goal: the Transparency of Arguments. Justice)*

> The concept of a surveyable representation is of fundamental significance for us. It designates our form of representation, the way we look at things. (A kind of "*Weltanschauung*", as is apparently typical of our time. Spengler.) (Wittgenstein, The Big Typescript 2005, 307e)

> Methode der Philosophie: die übersichtliche Darstellung der grammatischen1 Tatsachen. Das Ziel: Durchsichtigkeit der Argumente. Gerechtigkeit.

He used this term once earlier in 1916, criticising the modern illusion that the laws of nature are explanations of natural phenomena. 'At bottom the whole Weltanschauung of the moderns involves the illusion that the so-called laws of nature are explanations of natural phenomena' (Wittgenstein *Notebooks 1914-1916*, 1961, 72[e]).

Wittgenstein used a metaphor of a picture, saying about changing a way of seeing of a reader.

> But was I trying to draw someone's attention to the fact that he is able to imagine that? —– I wanted to put that picture before him, and his acceptance of the picture consists in his now being inclined to regard a given case differently: that is, to compare it with this sequence of pictures. I have changed his way of looking at things. (Indian mathematicians: "Look at this!" (Wittgenstein PI 2009, §144)

II. CONCLUSION

Linguistic approach to reality – the notion that language *constitutes* reality, that the words function not just labels added to concepts, an attempt to eliminate externalism and Cartesian dualism was later subsequently developed in the works of structuralists and poststructuralists[8] combining ideas of later Ludwig Wittgenstein, Ferdinand de Saussure, Friedrich Nietzsche and others. Returning to Bergmann, who was mentioned above as the inventor of the term *linguistic turn*, according to his words, is a '*fundamental gambit as to method*' agreed upon by two different groups of linguistic philosophers: '*ordinary language philosophers*' (exemplified, in Bergmann's view, by Strawson) and '*ideal language philosophers*' (such as Bergmann himself) (Hacker 2013).

The history of the *linguistic turn* (not only in the meaning of analytical tradition), could be traced long ago in the history of philosophy. I argue that the crucial *linguistic turn* was made by German philosophers in the 18th century just after the Kantian 'Copernican revolution', the main figure

[8] The most influential representatives of this movements are: Michel Foucault, Jacques Derrida, Luce Irigaray, Julia Kristeva, Gilles Deleuze, Judith Butler.

here was Wilhelm von Humboldt. However, the prerequisites for this turn were laid much earlier by a large number of thinkers of the past of the European philosophical tradition, starting with the ancient Greeks.

In this article I have shown the similarities of Humboldtian ideas on language and reality (connection of language and thinking, it is an activity, a product of a community of people, systems of communication, that language constitutes a world-view or a picture of the world, and that it is impossible to understand the world of a non-human since our languages and minds are different) with the such of late Wittgenstein's.

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MSc. Julio Allo Mijans & Dr. C Rolando Bermejo Correa

ABSTRACT

The students of the course by meeting of the Chemical Engineering career do not have an academic base, hat is why they present many difficulties in learning, where the use of information and communication technologies (ICT) is included in the teaching-learning process. of Statistics. The objective of this work was to implement a didactic model that contributes to student learning during problem solving as a typical situation of the teaching- learning process of Statistics in the Chemical Engineering career.

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Learning of the Resolution of Statistical Problems of the Course by Meeting in Chemical Engineering

Aprendizaje de la Resolución de Problemas Estadísticos del Curso Por Encuentro en Ingeniería Química

MSc. Julio Allo Mijans[α] & Dr. C Rolando Bermejo Correa[σ]

ABSTRACT

The students of the course by meeting of the Chemical Engineering career do not have an academic base, hat is why they present many difficulties in learning, where the use of information and communication technologies (ICT) is included in the teaching-learning process. of Statistics. The objective of this work was to implement a didactic model that contributes to student learning during problem solving as a typical situation of the teaching-learning process of Statistics in the Chemical Engineering career. In the evaluation of the model from the theoretical and practical point of view, through the consultation of experts and the application of the proposal, respectively, its effectiveness is evidenced, based on the verified transformation of the cognitive- procedural and motivational- didactic dimensions.

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RESUMEN

Los estudiantes del curso por encuentro de la carrera de Ingeniería Química no tienen una base académica por eso presentan muchas dificultades en el aprendizaje, donde se incluye el uso de las tecnologías de la información y las comunicaciones (TIC), en el proceso de enseñanza aprendizaje de la Estadística. El objetivo de este trabajo fue implementar un modelo didáctico que contribuya al aprendizaje en los estudiantes durante la resolución de problemas como situación típica del proceso de enseñanza aprendizaje de la Estadística en la carrera de Ingeniería Química. En la evaluación del modelo desde el punto de vista teórico y práctico, a través de la consulta a expertos y de la aplicación de la propuesta respectivamente, se evidencia su efectividad, a partir de la transformación constatada de las dimensiones cognitivo-procedimental y didáctico motivacional.

I. INTRODUCCIÓN

El desarrollo vertiginoso de la ciencia y la tecnología reclama de constantes cambios y transformaciones a favor de la formación del hombre que necesita la sociedad moderna. Los estudiantes del curso por encuentro de la carrera de Ingeniería Química no tienen una base académica solida debido a que por diferentes motivos se vieron en la necesidad de insertarse en el mundo laboral, interrumpiendo su preparación para acceder a las carreras universitarias desde la enseñanza del nivel anterior, por eso presentan muchas dificultades en el aprendizaje, donde se incluye el uso de las tecnologías de la información y las comunicaciones (TIC), en el proceso de enseñanza aprendizaje de la Estadística.

Para la carrera de Ingeniería Química del curso por encuentro en la Universidad de Camagüey "Ignacio Agramonte Loynaz", se identifica como una necesidad la inserción de un modelo didáctico que contribuya al aprendizaje, en los estudiantes, durante la resolución de problemas como situación típica del proceso de enseñanza aprendizaje de la Estadística. La resolución de problemas, exige el desarrollo de conocimientos

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(saber), habilidades (saber hacer), capacidades (saber hacer con independencia), actitudes y valores (querer hacer); y de motivación (querer hacer), por lo que, resulta esencial el tratamiento sistémico de cada uno de estos aspectos como parte de la preparación que en este sentido recibe el estudiante en aras de enfrentar con éxito el proceso de enseñanza - aprendizaje. (Hernández Amaro, 2010).

Se ha corroborado, producto del análisis de las investigaciones realizadas que el énfasis fundamental apunta hacia el aprendizaje de conocimientos y habilidades, y su proceso de enseñanza. Es por ello, que se asume como objetivo implementar un modelo didáctico que contribuya al aprendizaje, en los estudiantes, durante la resolución de problemas como situación típica del proceso de enseñanza aprendizaje de la Estadística en la carrera de Ingeniería Química, a partir de los años de experiencia del autor principal en la enseñanza de esta asignatura.

II. MATERIALES Y MÉTODOS

2.1 El Aprendizaje de la Estadística en la Carrera de Ingeniería Química

En este aspecto, se debe hacer especial énfasis en los puntos de vista al respecto, expuestos por la Dr. C Doris Castellanos Simons, quien considera en su concepción de aprendizaje que el mismo es un "proceso dialéctico de apropiación de los contenidos y las formas de conocer, hacer, convivir y ser construidos en la experiencia sociohistórica, en el cual se producen, como resultado de la actividad del individuo y de la interacción con otras personas, cambios relativamente duraderos y generalizables, que le permiten adaptarse a la realidad, transformarla y crecer como personalidad." (Castellanos, 2000, p.14).

De este análisis, de lo antes expresado, se asume que, como parte del aprendizaje de los conocimientos estadísticos y de su interacción con los demás, el estudiante, experimenta cambios relativamente duraderos y generalizables, que le permiten adaptarse a la realidad, transformarla y crecer como personalidad.

2.2 La Asignatura Estadística y su Metodología

El programa de la asignatura Estadística para la carrera de Ingeniería Química recoge aspectos tales como la fundamentación teórica, los objetivos generales, el plan temático que contiene los contenidos, el sistema de evaluación, las indicaciones metodológicas generales y la bibliografía. según lo estipula el programa, la asignatura la recibe el estudiante en el primer año de la carrera y sus contenidos los aplica en todos los años apoyado en el uso de las TIC, donde se incluye el software profesional *Statgraphics*.

En los objetivos generales de la asignatura se establecen la consideración de aspectos que trascienden la esfera cognitiva de los estudiantes y se propone la realización de actividades en las que predomina una organización individual y grupal, así como, el uso racional del lenguaje propio de la estadística.

2.3 El Proceso de Resolución de Problemas Estadísticos

Los primeros intentos por "enseñar" a resolver problemas a los estudiantes, se encuentran en el siglo pasado, y consistían básicamente en una serie de recomendaciones formales que intentan fijar su atención sobre la pregunta, leer cuidadosamente, encontrar datos, y meditar la respuesta. O sea, se trataba de un esquema: incógnita, datos, resolución y respuesta.

El profesor húngaro George Polya, en 1945, ofreció una serie de estrategias que debían constituir una herramienta fundamental en la enseñanza de la resolución de problemas. No obstante, sus ideas no comenzaron a tener una influencia generalizada hasta la década de los años 80, una vez que se fijó la atención en la resolución de problemas como una actividad esencial en la enseñanza y para el aprendizaje de las ciencias.

A partir de la sistematización, de la bibliografía especializada, se puede determinar las regularidades asociadas al proceso de resolución de problemas. En este trabajo se plantean las siguientes:

En cuanto a la definición de "problema": Toda situación en la que hay un planteamiento inicial y una exigencia que obliga a transformarlo, donde la vía para pasar de la situación inicial a la nueva situación exigida tiene que ser desconocida.

De este análisis se asume como problema estadístico aquel que, cumpliendo las regularidades anteriores, enmarca su contenido en el sistema de conceptos, fenómenos, leyes y principios abordados en una o varias teorías de la estadística.

En cuanto a la definición de "resolución de problema": Acto de encontrar las vías para resolver la contradicción que se da entre lo conocido y lo desconocido que permita encontrar la respuesta correcta.

De este análisis se asume como resolución de problema estadístico es una secuencia de pasos lógicos, necesarios para resolver la contradicción que se da entre lo conocido y lo desconocido de forma tal que permita encontrar la respuesta correcta.

2.4 El Proceso de Resolución del Problema Estadístico Mediante el Uso de Las (TIC)

Los autores consultados, proponen las siguientes fases dentro del proceso de resolución de problemas: Comprensión del problema, ejecución, y evaluación.

Comprensión del problema

En esta fase, el estudiante, a través de la lectura del enunciado del problema estadístico se familiariza con la situación, aclara el significado de todos los términos que aparecen en el texto e interpreta toda la información que se le brinda y establecer qué relación debe hacer operativamente para determinar lo que se necesita para resolverla, centrando la atención en lo que se debe encontrar.

Ejecución

Como parte de esta fase, el estudiante, debe encontrar el método y las técnicas estadísticas adecuadas para resolver el problema y ponerlo en ejecución a partir de relacionar la situación dada en el problema con los conocimientos y experiencias adquiridas con anterioridad. Aquí, resulta esencial que analice, considere y planifique una estrategia de resolución antes de decidirse a resolver el problema con la ayuda del software profesional *Statgraphics*.

Evaluación

Como parte de esta fase, el estudiante, debe establecer una correspondencia entre lo pedido en el problema, las acciones realizadas y sus resultados desde que estima un posible dominio para su resultado, hasta que comprueba la coincidencia de ambos elementos al final. También implica el análisis de la existencia de otras posibilidades de solución para valorar cuál es la más eficiente y el posible uso de estas vías en otros problemas con características similares.

De este análisis se asume que, la resolución de problema estadístico con el uso de las (TIC) se puede dividir en tres fases fundamentales: Comprensión del problema estadístico, ejecución de una estrategia de resolución con la ayuda del software profesional *Statgraphic*s, y evaluación de la correspondencia entre lo pedido en el problema, las acciones realizadas y sus resultados obtenidos.

2.5 Modelo Didáctico Para Contribuir al Aprendizaje de la Resolución de Problemas Estadísticos en los Estudiantes del Curso Por Encuentro en la Carrera deIngeniería Química

La modelación es considerada en este trabajo como una vía para desarrollar el aprendizaje de la resolución de problemas estadísticos en los estudiantes del curso por encuentro de la carrera de Ingeniería Química. El proceso de modelación realizado concluyó con la elaboración del modelo que posibilitó estudiar las particularidades del objeto que se investiga.

Se asume como modelo didáctico "la representación de aquellas características esenciales del proceso de enseñanza-aprendizaje o de alguno de sus componentes con el fin de lograr los objetivos previstos." (Valle, 2009, p.11).

Desde la perspectiva filosófica, se parte del reconocimiento de la dialéctica materialista como fundamento del modelo que se propone para

posibilitar el estudio, análisis, comprensión y valoración del proceso dirigido. A tono con lo anteriormente expuesto, se asume como idea fundamental, defendida por la Sociología de la Educación, la relación que se establece entre estudiante-estudiante, estudiante-profesor y entre estos y el grupo en general, lo que presupone la consideración de las particularidades de dicha relación en el marco del proceso de enseñanza aprendizaje.

Desde el punto de vista psicológico, constituyen fundamentos teóricos esenciales en el presente trabajo las ideas desarrolladas por la escuela histórico-cultural creada por Vigotski (1924-1934) y continuada por un grupo de seguidores. De gran importancia teórica y metodológica para el estudio, son las categorías situación social del desarrollo (SSD) y zona de desarrollo próximo (ZDP) como fundamentos esenciales que han de tenerse en cuenta al concebir los problemas estadísticos que debe resolver el estudiante.

Desde el punto de vista pedagógico el modelo está dirigido al aprendizaje de la resolución de problemas estadísticos en el curso por encuentro de la carrera de Ingeniería Química, y se concreta en un proceso de enseñanza-aprendizaje desarrollador cuya integralidad se concibe a través de la unidad de lo instructivo, lo educativo y lo desarrollador como dimensiones del proceso de formación integral de la personalidad del estudiante.

III. RESULTADOS Y DISCUSIÓN

El modelo que se propone tiene plena vigencia y necesidad en la formación profesional del estudiante en el curso por encuentro en la carrera de Ingeniería Química (contextualizado), es abierto, susceptible de perfeccionamiento y enriquecimiento a partir de su introducción y generalización en la práctica pedagógica, posee capacidad para incluir los cambios que se operan en la realidad (flexibilidad, utilidad y permanencia) y de aproximarse al funcionamiento real del objeto (validez y confiabilidad).

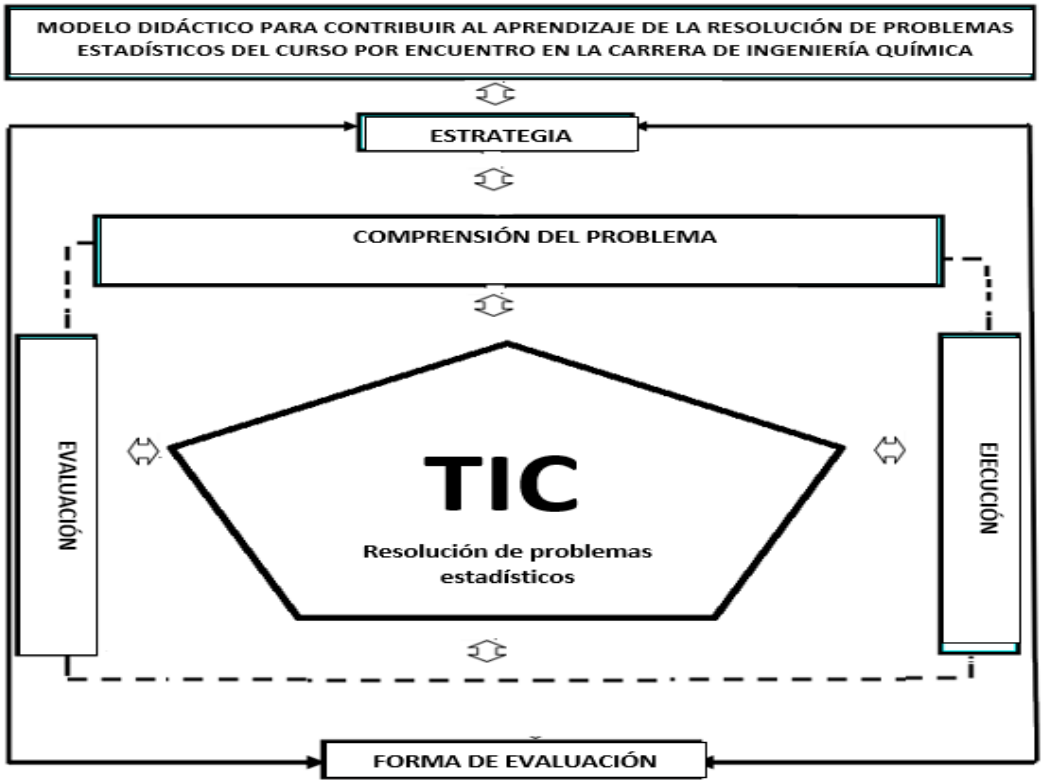

Gráfico 1: Modelo didáctico para contribuir al aprendizaje de la resolución de problemas estadísticos del curso por encuentro en la carrera de Ingeniería Química

Para la constatación del grado de viabilidad del modelo didáctico que se propone se adoptó desde el punto de vista teórico la Consulta a Expertos (método Delphi) y desde el punto de vista práctico, el método experimental en su versión del pre – experimento pedagógico (como introducción parcial), los cuales permitieron obtener la información necesaria en esta dirección.

Para la implementación en la práctica del modelo se concibe una estrategia. En el marco referencial del presente trabajo, la estrategia es comprendida como la manera de planificar y dirigir las acciones para alcanzar determinados objetivos y que tienen como propósito esencial la transformación del objeto de investigación desde un estado real a uno deseado. (De Armas, Ramírez y otros, 2003, p. 48). En el campo educacional las estrategias como resultado científico pueden ser de diferente tipo, entre otras: educativas, pedagógicas, didácticas y metodológicas.

En el presente estudio se asume la estrategia didáctica, definida por Addine, 1999 como: "secuencia integrada de acciones conscientes y procedimientos seleccionados y organizados, que atendiendo a todos los componentes del proceso persiguen alcanzar los fines educativos propuestos". (Addine, 1999, p.27).

Del proceso de planeación estratégica devino el esquema que a continuación se Muestra.

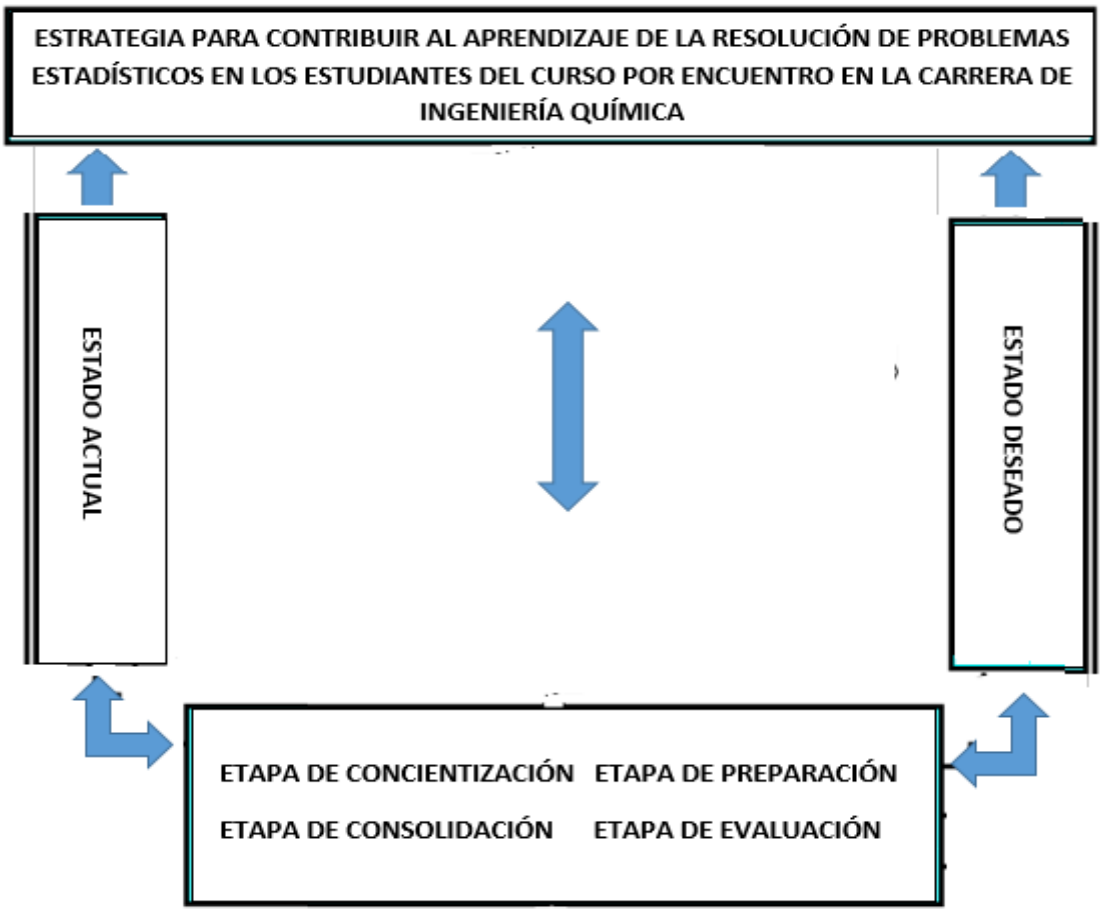

Gráfico 2: Estrategia para contribuir al aprendizaje de la resolución de problemas estadísticos del curso por encuentro en la carrera de Ingeniería Química

IV. CONCLUSIONES

Una de las grandes aspiraciones de las entidades educativas es implementar modelos didácticos que les permita ser cada vez más eficientes en el proceso de enseñanza aprendizaje. En consideración con el estado de preparación constatado fue necesario confeccionar un modelo para contribuir al aprendizaje de la resolución de problemas estadísticos en los estudiantes del curso por encuentro en la carrera de Ingeniería Química. El análisis de la información ofrecida por los expertos respecto a los indicadores sometidos a su consideración, evidencia como categoría otorgada la de *MUY ADECUADO*.

Para su implementación en la práctica pedagógica se concibió una estrategia como expresión de un accionar por etapas. Los criterios manejados por los expertos y los resultados cuantitativos y cualitativos obtenidos con la aplicación del método de experimentación, en su versión del pre-experimento pedagógico, revelan la transformación favorable de la variable (dimensiones e indicadores), su concepción teórica y relaciones, lo que *JUSTIFICA SU VIABILIDAD*.

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