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The Relations of Human Capital to Economic Growth and the EU 2020 Strategy: A Market Based Approach in Memory of Gary Backer

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ABSTRACT

"The greatest improvement in the productive powers of labor, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labor" is the opening sentence of Adam Smith's *Wealth of Nations*. According to Smith market dimension determines the level of specialization. Specialization implies more knowledge. The final result is higher growth. After Smith economists did not pay any more attention to human capital. Their attention was kept by population (Malthus) or by physical capital stock (neoclassic school). At the beginning of the sixties of the XX century Gary Backer published his fundamental contribution to the theory of human capital. This paper examines the basic features of Backer's model. The focus is on how a country can generate a competitive advantage in the production of human capital. Human capital has grown rapidly in both US and EU where represents a wide fraction of total capital. Investment in education is thus more and more the core engine of long run growth. Subsequently on the base of Backer's theory the paper examines the case of EU and "Europe 2020" strategy. Final considerations will deal with Turkey's economic development and the need for a quality education policy, based on investments and on market incentives, bound to guarantee growth sustainability.

***Keywords*:** Human Capital, Economic Growth, EU

Beşeri Sermayenin Ekonomik Büyüme İlişkileri ve AB 2020 Stratejisi: Gary Backer Anısına Piyasa Tabanlı Bir Yaklaşım

ÖZ

"Emeğin üretimdeki gücündeki ve ustalık, beceri ve her yere yönetilen veya uygulanan muhakeme yeteneğinin büyük bir bölümündeki en büyük gelişme işbölümünün etkileri olmuş gibi görünüyor" Adam Smith'in *Ulusların Zenginliği*'ndeki açılış cümlesidir. Smith'e göre piyasa boyutu uzmanlık düzeyini belirler. Uzmanlık fazla bilgiyi ifade eder. Nihai sonuç ise yüksek büyümedir. Smith'ten sonra ekonomistler, insan sermayesine çok fazla önem vermediler. Onların dikkati nüfus (Malthus) veya fiziksel sermaye stoku (neoklasik okul) tarafından tutuklu kaldı. XX yüzyılın altmışlı yılların başında Gary Backer beşeri sermaye teorisine temel katkısını yayınladı. Bu çalışma Backer modelinin temel özelliklerini inceler. Bu çalışmada odak noktası bir ülkenin beşeri sermayenin oluşumunda rekabet avantajının nasıl oluşturulduğudur. Toplam sermayenin geniş bir kısmını temsil eden insan sermayesi, hem ABD'de hem de AB de hızla büyüdü. Uzun dönemli ekonomik büyümenin temel kaynağı böylece eğitime yatırımdır. Bu çalışma daha sonra Backer teorisinin temelinde AB ve "Avrupa 2020" stratejisini inceler. Nihai değerlendirmede, Türkiye'nin ekonomik kalkınması ile yatırımlar ve piyasa teşviklerine dayalı sürdürülebilir büyüme garantisine bağlı kaliteli eğitim politikası ihtiyacı incelenecektir.

Anahtar Kelimeler: Beşeri Sermaye, Ekonomik Büyüme, AB

Gary Backer died on 3 May 2014. He was awarded the Nobel Memorial Prize in Economic Sciences in 1992. He made important contributions to the human capital branch of economics. This article is dedicated to his fundamental contribution to the theory of human capital (1993), neglected by economic thought after the times of Adam Smith.

THE IMPORTANCE OF HUMAN CAPITAL

Human capital can be broadly defined as the stock, the patrimony of capabilities of which a physical person is endowed. Capabilities are a whole constituted by knowledge, ability, techniques, know-how and physical strength. In substance by all what a person confers to a job, physically and mentally. In the primitive society job was essentially physical. However, even in the primitive society, human action has been characterized by the presence of knowledge. Stone Age, Bronze Age and Iron Age have seen ability and knowledge more and more present in any manifestation of human labor and activities. Indeed the presence of knowledge makes the difference between humans and animals. Animals use certain techniques to perform their job (lions while hunting or castors while constructing their dams); these techniques cannot be considered as knowledge as they remain constant during the times. Only humanity has the capacity to develop techniques improve them, find new ones and to accumulate a patrimony of knowledge. The evolution of this patrimony is what has determined the evolution of the civilizations and ultimately their rise and (sometimes) fall. The Maya and Inca civilizations reached a high level of development thank to the knowledge that they have been able to develop; their fall was due to the destruction perpetrated by the Spanish conquest. That destruction vanished centuries and centuries of cultural development and dispossessed humanity of the benefits associated with that knowledge. The history of humanity is plagued with burning of libraries and books, the main example being the reiterated burnings of the library of Alexandria Where human development would be today without all the destructions suffered because of wars, violence, intolerance or simply ignorance, is not possible to say, but surely would much more pronounced.

War damages are generally estimated as a loss of physical capital. Actually the biggest losses associated with wars are in terms of human capital. First because of the human losses (military and civil), second because of the destruction of physical capital dedicated to the creation of knowledge: universities, laboratories and their equipment, besides the already mentioned libraries. Furthermore the reconstruction of human capital takes much more time than the reconstruction of physical capital. It can take one or two year to build a new hospital, however the capabilities to master a certain pathology can be formed in no less than three decades, if we consider the all educational process to form, for instance, a cardiovascular surgeon.

Capital, in economics, is a mean of production used by man to produce other goods, tool machinery is capital used to produce intermediate goods to be used in the productive system. Capital is also a sum of money or a financial activity. Remuneration is what the owner of physical and financial capital is expecting from both. They are not hold for other purpose than obtaining an income. The expenditures incurred to buy these assets are considered as an investment. Similarly expenditures in education, elementary, high, professional or any in other type of activity having as result the improvement in the capabilities of a person, have to be considered as an investment. Increased capabilities generate, in normal conditions, higher income. Say it other words, in normal conditions, the person investing in his/her education, the person who desires to improve his/her own knowledge is expecting a return from this investment in terms of higher quality of this job place and higher level of remuneration. Whether this expectations are not fulfilled the phenomenon of brain drain takes place. The effects of investments in human capital are not limited to the enhanced condition of the person possessing these higher capabilities. Indeed human capital investments generate spillovers effects. Actually this is the main social and economic function of investments in knowledge. Increase in the quality of human capital determines a higher level of productivity. In turn this higher level of productivity generates benefits for other individuals. As a result of the process the whole society takes advantage out of the investments in knowledge.

The history of economic development teach us a fundamental lesson: no process of sustained and sustainable economic development can take place without a parallel increase of investments in education and training. One of the most striking cases is that of Japan. For almost four decades after World War II the Japanese economy grew at astonishing rates, creating the second largest economy of the world. That process was accompanied by intensive investments by the government and by the private sector into the educational sector. Between 1945 and 1960 the share of public expenditure in GDP grew from 2% to 6%. In a 2005 OECD report on education in Japan we read:

Several indicators confirm Japan's prominence in the global knowledge economy. Among them, OECD's number of triadic patent families, that indicates inventive performance, diffusion of knowledge and internationalization of innovative activities, shows Japan second only to the United States in absolute terms and third after Switzerland and Finland when compared on a per-capita basis.[1]

The success story of Japan in educational investments is not only a matter of their quantity, but also a matter of their quality. Technical education was considered as a priority, not only for higher education but also at primary and secondary school levels. Mathematics, natural sciences, engineering, computer science and so on represented

1 OECD, Education at a Glance 2005.

the bulk of educational public and private investments. Private firms, especially in the automotive sector, played a basic role in enhancing the creation of knowledge in Japan.

South Korea (from the seventies) has molded its educational policies on the Japanese case. The results have reflected into Korea's overall rate of growth. Both Japan and Korea are efficient market economies; as the United States, Switzerland and Finland, the three countries indicated by the OECD as the most prominent knowledge based economies. The relation between human capital, economic freedom and economic growth is examined in the next section.

MARKET DIMENSION, LABOUR SPECIALIZATION, HUMAN CAPITAL AND GROWTH

At the beginning of the beginning we find human capital.

The greatest improvement in the productive powers of labor, and the greater part of the skill, dexterity, and judgment with which it is anywhere directed, or applied, seem to have been the effects of the division of labor.[2]

It is the opening sentence of Adam Smith's *Wealth of Nations*. Then we read:

It is the great multiplication of the productions of all the different arts, in consequence of the division of labor, which occasions, in a well-governed society, that universal opulence which extends itself to the lowest ranks of the people.[3]

These two sentences are quoted by Gary Becker and Kevin Murphy[4]. Skill, dexterity, and judgment are elements of human capital. The improvement in human capital is the consequence of the division of labor, the division of labor is limited by the market dimension. The effect of the division of labor is economic growth (universal opulence extended to the lowest ranks of the society). Baker and Murphy explain that when a worker commits himself to s specialized activity his marginal returns are increasing, consequently his productivity is improved. Conversely when the activity of a worker is distributed over a wide range of actions he rapidly incurs in diminishing returns and his productivity decreases. They recognize that market dimension is a limiting factor for labor specialization, but is not the only one. Smith, they argue, has not deepened the analysis of the factors determining labor specialization and, consequently, the improvement of human capital.

2 Chapter I : Of the division of labour : http://oll.libertyfund.org/?option=com_staticxt&staticfile=show.php%3Ftitle=237&chapter=212260&layout=html&Itemid=27

3 Ibidem

4 *The Division of Labour, Coordination Costs and Knowledge*, in Gary S. Becker "Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education I", The University of Chicago Press, Chicago, 1993.

Sometimes the division of labor is limited by the extent of the market, but more frequently in the modern world it is limited by other forces. Our analysis will place the extent of the market in proper perspective by considering it along with other forces that affect the degree of specialization.[5]

The fact is that when labor specialization raises a number of inconveniences can accompany it. Coordination costs are indicated by the Authors as the main factor affecting labor productivity when the size of the team rises. They call a "team" a group of workers who cooperate to produce by performing different tasks and functions. Why is that so?

Conflict among members generally grows with the size of a team because members have greater incentives to shirk when they get a smaller share of output […]. Further, the chances of a breakdown in production due to poor coordination of the tasks and functions performed by different members, or to communication of misleading information among members, also tends to expand as the number of separate specialists grows.[6]

The limits to labor specializations are thus linked to the difficulties in coordinating bigger and bigger teams. Increasing coordination costs imply and optimal size of the team. The efficient specialization is limited by coordination costs and not by market size. Becker and Murphy provide in their article examples of increasing coordination costs: medical services, the work of historians, economists and lawyers. Subsequently, analyzing coordination costs in the industrial sector, they argue:

Specialized members of a team […] who are employed by different firms have their activities coordinated by contracts and other agreements that govern transactions across firms. Companies that cut the material for a dress manufacturer or supply car doors to General Motors are part of the "teams" producing particular dresses or General Motors cars. In market economies of the modern era, even firms involved in producing the simplest goods, such as pencils, use many downstream and upstream firms to produce these goods, so that modern teams are very large.[7]

The underlined sentence reaches a crucial point: modern teams are very large, even for the production of simple goods. If this was true in 1993 it is much truer twenty years later. Let's consider the case of a simple product like jeans. Cotton is grown in Kazakhstan, spun and waived in India, then assembled in Bangladesh, buttons and zippers are imported from China. Then the finished product is shipped to Singapore and from here distributed all over the world. In the case of a more sophisticated product like computers things are more or less the same. The product is

5 Ibidem p. 303.
6 Ibidem p.303.
7 Ibid. p. 305, underlined not of the text.

assembled in China; components are imported from Europe, Japan and other Asian countries. Then they are shipped abroad. In both cases the "teams" participating in those diffused productive processes may include a dozen of enterprises and several hundred workers. Coordination difficulties have been overcome. The dimension of the network is no more a limit. This has been made possible thank to the development of communication and information technologies and to the software for the management and monitoring of coordinated operations among different firms. This takes us to interfirm cooperation. Namely, to the cooperation between small and medium sized enterprises (SMEs). Cooperation between small firms has been studied from several perspectives. There are studies focusing on regional industrial districts or clusters, where spatial concentrations of firms in a single or closely related line of work are found. The industrial districts of the north-east and center of Italy would be an example of successful interfirm cooperation of this type. Another example is that of the so called Anatolian tigers, the Turkish clusters of Kayseri or Konya.

Interfirm cooperation leads to a high degree of labor specialization and to a consequent rise in human capital. What we have seen up to know takes us to a first conclusion. We are back to Adam Smith. In the sense that market dimension in today's world is the most important determinant of labors specialization. However as market dimension corresponds, in most cases, to the whole world, our first conclusion is that labor specialization is limited by the dimension of the global economy.

LABOR SPECIALIZATION AND HUMAN CAPITAL

But what about the link between labor specialization and human capital? In order to answer this question and come to a second conclusion we have to start from the Fordist system of industrial mass production.

The old Fordist system was based on detailed division of tasks alongside the productive process was not surely the best way to increase human capital, at least within a certain enterprise or a certain industrial sector. After WW II this system has been challenged, in Japan, by the Toyotist system or lean production system, in which human capital, or to say it more harshly, human brain plays a fundamental role. Actually the difference between productivity levels of Fordist system and Toyotist system is due to much more strong reliance on human capital of the latter in respect to the former. These results have been highlighted since the beginning of the nineties of the past century in a famous report by MIT[8]. One of the core elements of lean production is the so called kanban system or signboard system. A suggestion provided by a worker to improve the efficiency of the production line. Kanban is effective tool to

8 Womack, James P., Daniel T. Jones, and Daniel Roos (1990), *The Machine That Changed the World*, MIT.

support the running of the production system as a whole. In addition it proved to be an excellent way for technological improvements, what is known as kaizen. Although lean production can be implemented in a more widespread way in big enterprises it can be extended also to SMEs. In this perspective the Japanese lesson in quite instructive.

The productivity improvement which is the consequence of the implementation of lean production methods conduct to higher growth. Lean production type labor organization shows the way to the improvement of human capital, first because to implement lean production more skillful labor force is required, second because of on the job learning by doing. The knowledge created by learning by doing and kanban system is informal knowledge that cannot be measured or captured by any statistics. Human capital stock tends, consequently, to be underestimated. It is worthwhile mentioning that this type of practical knowledge is an aspect of the knowledge concept on which Friedrich Hayek was reflecting in the midst of the forties of the past century[9]. According to Hayek scientific knowledge is not the only type of knowledge which is relevant.

We need to remember only how much we have to learn in any occupation after we have completed our theoretical training, how big a part of our working life we spend learning particular jobs […]. To know and put to use a machine not fully employed […] is socially quite as useful as the knowledge of better alternative techniques.

Hayek complained that this knowledge was considered with a kind of disdain. This is true also today. Formal knowledge, the one represented in a study certificate, by a degree, sometimes has much less value than practical knowledge, and sometimes is much less valuable than the value of the piece of paper on which the degree is printed.

However human capital development is not only linked to the internal organization of the firm. The sector composition of industry is even more important. Italy represents the case of a country suffering sluggish growth just because of the insufficient evolution of it productive system towards more high-added value, high-tech, research-intensive, knowledge-intensive industrial production. Transition economies, such as BRICS and Turkey are facing this challenge. Mastering this challenge, as Japan did in his times (from fifties to eighties) is essential in order to maintain a high rate of growth. Capacity to transform, capacity to shift resources form mature sectors to technology intensive ones, capacity to create new competitive advantages is an indispensable ingredient of economic growth. All this calls for more quality-intensive human capital. The problem should be seen in terms of demand and supply for goods and services whose production requires human capital. In the economic system human capital is not demanded as such, but for his capacity to conceive, produce and distribute goods and services. It is a derived demand.

9 Hayek, Friedrich (1945), The Use of Knowledge in Society, *American Economic Review*, 35(4), pp. 519-530.

Let consider the case of a country (Home) trading with the rest of the world (Row). No significant barriers to trade exist. The price system is working smoothly. In the rest of the world economic conditions are changing rapidly. New comers are manufacturing labor-intensive and low cost products and selling them on the international market. Home wages and prices are no more competitive. Home has to look for new competitive advantages. Has to acquire the capacity to fulfill the demand for high-technology, research-intensive products. Put it briefly has to change the composition of its export.

Change brings economic problems. In the global world we leave in, the importance of change is increasing. Consequently economic policy must be able to face the challenge of change by providing a rule framework accompanying and stimulating change, not opposing it. This is a crucial point. If Home's economic policy hinders change, if it considers not relevant the importance of change, if it judges change not to be a priority, if it believes that things can continue as before, it is rendering the worst service to the country, clipping the wings of its economic development.

New products and services have to be supplied for both internal consumption and for exporting them. This implies a shift of resources from mature sectors to growing sectors and a shift of resources within certain sectors but towards the production of high quality goods. This shift will mainly be guided by the price system. Prices send messages to the investors telling them whether or not it is convenient to enter a certain market. Entrepreneurs react to changes in price levels by disinvesting and investing.[10] To start a new production new physical capital is needed but also new human capital. Labor mobility is essential in this process. Consequently labor regulations have to comply with it. Any attempt to freeze the system will cause a drop in the potential (and effective) rate of growth.

Adaptation to changes is thus the key to development and growth. The main contribution that economic policy can give to growth is to facilitate and go along with these changes. Pursue economic, educational and a cultural freedom is a promising way to favor adaptation to changes within the society.

Face to the change, human capital development calls for structural reforms and corresponding investments. Structural reforms and investments in knowledge to improve human capital must go hand in hand. The basic problem that the reform-investment process has to tackle is adapting knowledge supply to knowledge demand, given the level of economic development attained and attainable (in the foreseeable future) by the concerned country. Reforming and investing in knowledge is a long run process, consequently actions in this sense have to be based on expected needs.

10 If state intervention through subsidies distorts prices, these can be a misleading guide for investors, inducing them to invest in the wrong direction. Once the subsidy is lifted the profitability of that investment reveals all its fallacy. Misallocation of resources and negatively affected rate of growth are the inevitable consequence.

Reforms must point to stimulate competition within the educational sector and especially for higher education. What has to be avoided is State monopoly of education. Private sector has an important role to play in higher education and in research. A system implying competition between universities is the best way to stimulate excellence, improving the quality of human capital. Universities compete when they are free to create and offer their own cultural product. A quality cultural product is the one which is providing attractive opportunities to the students, both in terms of quality of the job and of its remuneration. Indeed decisions to invest in one's own formation and knowledge are strictly based on these two variables. The individual reacts to these incentives and invests accordingly.

The growth of knowledge determines the growth of labor specialization. Backer and Murphy write:

The engineering, medical, and economics examples illustrate that much of the growth in specialization over time has been due to an extraordinary growth in knowledge.[11]

It is the extensive cooperation among highly specialized workers that enables advanced economies to utilize a vast amount of knowledge. This is why Hayek's emphasis on the role of prices and markets in combining efficiently the specialized knowledge of different workers is so important in appreciating the performance of rich and complex economies.[12]

The best strategy for Home to face the challenge of modernization of its industry and creation of a knowledge based economy is keeping its own economy open and the market mechanism working. Price and expected income related incentives will guide the individuals in their investments decisions concerning education. Knowledge supply and demand will match in a competitive environment where teaching freedom is assured. An equilibrium of excellence as competitive forces improve the quality of teaching. This process will finally result in enhanced growth and higher levels of human capital.

HUMAN CAPITAL IN THE EU AND 'EUROPE 2020' STRATEGY

In the first section we argued, giving a few examples, that human capital and human knowledge are the most costly victims of wars. Europe, as any other part of the world, has been plagued with wars from the beginning of history until the end of WW II. The European integration's method for peace did not come out of the blue after 1945. It is

11 G. Becker and K. Murphy, Op. Cit. p. 307.
12 Ibid. p. 308

the product of a long evolution of though. From the Revelation of Jesus the Nazarene, who was born from a Jewish woman, continued by his apostles in the provinces of the Roman Empire, the message of peace embodied in Christianity, has evolved, thank to Erasmus, Kant and other liberal thinkers (L. Mises, L. Einaudi and L. Robbins to quote just a few of them) into the peace theory which is at the base of the European construction. The European method for peace, among a long series of benefits, has preserved human capital from war time destructions. The Swiss philosopher and writer Denis de Rougemont (1906-1985) once wrote that the Einstein's equation could have been read in the sense that Europe is the product of a small mass and an enormous culture, symbolized by $E=mC^2$. European integration has further increased the stock of culture and human capital of the Old Continent by preserving peace. This is the main and unparalleled contribution of the European construction to humanity. However EU lags behind US in too many technological fields. This is the consequence of the insufficient integration of research efforts at EU level. We need more coordination among knowledge producing centers in Europe. What we need is a single market for research and knowledge transfer, in order to avoid multiple efforts where a pooling of efforts is the most efficient and effective strategy. We have to put our forces together to reach the critical mass allowing the maximization of knowledge production.

In the previous section we have seen that freedom and competition among research centers and universities, which implies a system where both public and private universities coexist, are essential in order to reach excellence. Again, the price system would allow the best coordination and use of scientific resources and a deeper division of labor. There is no need for a global plan implemented by a central authority, conversely what we need is to put more market into education and training policies. Only such a coordinated and integrated market could allow EU to fill the gap with US. Europe is still in a catching-up process in science and technology with respect to US.

In the year 2000 being wholly aware of this gap the European Commission launched the Lisbon Strategy. Its aim was to make EU the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion by 2010.[13]

Lisbon Strategy has been revised in 2005; however results have been disappointing. The main reason is that education and research policies are still in the hands of Member States and commitments have not been respected. States, it is a longstanding tradition, are the first not to respect what they have previously underwritten. Face to this situation the European Commission has launched a new action: 'Europe 2020'strategy.[14]

13 European Council, Presidency Conclusions, Lisbon, 23-24 march, 2000.

14 Council of the European Union, Council conclusions on the role of education and training in the implementation of the 'Europe 2020' strategy.
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:070:0001:0003:EN:PDF

The following are the main preliminary considerations:

Education and training have a fundamental role to play in […] equipping citizens with the skills and competences which the European economy and European society need in order to remain competitive and innovative vocational education and training (VET) has a key role to play in supporting the aims of the 'Europe 2020' strategy by providing relevant, high quality skills and competences.

Europe's education and training systems need to provide the right mix of skills and competences, to ensure a sufficient supply of science, math's and engineering graduates, to equip people with basic skills and the motivation and capacity to learn, to foster the development of transversal competences, including those that enable the use of modern digital technologies, to promote sustainable development and active citizenship, and to encourage creativity, innovation and entrepreneurship.

On these bases the Council of the EU highlights:

Investing efficiently in high quality, modernized and reformed education and training is urgent because it will both lay the foundations for Europe's long-term prosperity and also, by providing people with more and better skills and competences, help to respond in the short-term to the effects of the crisis.

Strengthening lifelong learning opportunities for all and at every level of education and training is essential, notably by improving the attractiveness and relevance of VET and by increasing the participation in, and the relevance of, adult learning.

Increased efforts will be required in order to increase […] the proportion of 30-34 year olds having completed tertiary or equivalent education to at least 40 % — will have a positive effect on jobs and growth. Moreover, measures taken in the education and training sector will contribute to achieving the targets in other areas, such as increasing employment rates, promoting research and development, and reducing poverty.

Finally, among other things, the Council invites Member States to:

Adopt National Reform Programmes (NRPs) which are targeted and action-based, and which will contribute to achieving the objectives of the 'Europe 2020' strategy, including the EU headline targets.

Promote reinforced cooperation between higher education institutions, research institutes and enterprises with a view to strengthening the knowledge triangle as the basis for a more innovative and creative economy.

CONCLUSIONS

Labor division is the most powerful engine for the growth of human capital. Thank to technological improvements in the organization of the team in charge of a certain production, coordination costs can be mastered. Labor division has again the only limit of market dimension, as stated by Adam Smith. The global economy is thus the new limit to labor division. This implies that labor division can be increased to a very high extent; consequently the need for higher human capital is growing.

The type of knowledge needed by advanced countries (OECD member States) is quite ample. Scientific knowledge is just one aspect of what they need. Practical knowledge (the one indicated by Hayek) is of basic importance in order to create the knowledge based society as it has been conceived in the Europe 2020 strategy. Countries do not have to rely on big centralized plans to tackle this challenge. Fostering competition among schools and universities and allowing the working of motivational mechanisms is the best way to pave the road leading to knowledge society.

The contribution of knowledge to economic growth can be a reality only in a free society where the individual has the liberty to choose according to his capabilities and interests and where he can find what he is looking for.

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