Comunicar, n. 52, v. XXV, 2017 | Media Education Research Journal | ISSN: 1134-3478; e-ISSN: 1988-3293
www.comunicarjournal.com

Digital Reading and Reading Competence: The influence in the Z Generation from the Dominican Republic

Lectura digital en la competencia lectora: La influencia en la Generación Z de la República Dominicana

Cristina Amiama-Espaillat is Professor in the Department of Education at the Catholic University Madre y Maestra (Dominican Republic) (cm.amiama@ce.pucmm.edu.do) (http://orcid.org/0000-0002-8222-1530)
Dr. Cristina Mayor-Ruiz is Associate Professor in the Faculty of Sciences of Education at the University of Seville (Spain) (crismayr@us.es) (http://orcid.org/0000-0001-7101-044X)

ABSTRACT
Most Latin American countries are focused upon improving learning quality by providing schools with technological resources, as if their sole presence was enough to develop 21st Century skills. Digital reading is not an end in itself; it is a tool that a user selects, depending on the desired purpose and uses it in specific contexts. Adolescents access Internet with at least four purposes: academic, recreational, socialization and communication. This study describes said purposes in adolescents from the Dominican Republic and relates them to their reading literacy proficiency level in two educational contexts: public and private schools. The sample group included 382 students in their fourth year of secondary school (10th grade). Two instruments were used: CoLeP, based on texts from PISA, and a Scale to measure reading frequency, which classifies the four reading purposes in two formats: printed and digital. The conclusion is that most students access and use the Internet for academic purposes, regardless of the educational sector. Nevertheless, reading literacy proficiency differs significantly with students from public schools being in lower levels. This minimizes the opportunities of the most vulnerable social sectors producing reading illiterates that have high economic costs for the nation.

RESUMEN
La mayoría de los países latinoamericanos están focalizados en elevar la calidad de los aprendizajes mediante la dotación de recursos tecnológicos a los centros educativos como si su mera presencia bastara para desarrollar las competencias fundamentales del siglo XXI. La lectura digital no es un fin en sí mismo, es un medio a disposición del usuario que la selecciona según sus propósitos y las utiliza en contextos socioculturales específicos. Los adolescentes acceden a Internet, al menos con cuatro fines: académicos, recreativos, para participar en la sociedad y comunicarse. Este estudio describe dichos fines en jóvenes de la República Dominicana y lo relaciona con el nivel de competencia lectora en dos contextos educativos, escuelas públicas y privadas. La muestra está compuesta por 382 estudiantes de cuarto de Secundaria. Se aplicaron dos instrumentos: CoLeP, basado en los textos liberados de PISA y una Escala de Práctica de Lectura, que clasifica los cuatros fines de lectura en dos formatos, impreso o digital. La conclusión es que casi todos los estudiantes acceden a Internet y lo utilizan para fines académicos sin importar el sector educativo, sin embargo, el nivel de competencia lectora difiere significativamente, ubicándose los estudiantes de las escuelas públicas en los niveles más bajos, lo que resta oportunidades a sectores socialmente más vulnerables y produce neoanalfabetos con altos costos económicos para la nación.

KEYWORDS | PALABRAS CLAVE
Internet, digital reading, reading competence, reading illiterates, digital gap, Z Generation, Secondary, social network.
Internet, lectura digital, competencia lectora, neoanalfabetos, brecha digital, Generación Z, Secundaria, redes sociales.

Received: 2016-11-28 | Reviewed: 2017-01-04 | Accepted: 2017-03-13 | Preprint: 2017-05-15 | Final Publication: 2017-07-01
DOI: https://doi.org/10.3916/C52-2017-10 | Pages: 105-113

1. Introduction

Access and use of information and communication technology (ICT) are fundamental to participate in today's society. However, a lacking adequate development in reading literacy –defined as: "understanding, using, reflecting on and engaging with written texts, in order to achieve one's goals, develop one's knowledge and potential, and participate in society "(OECD, 2009: 23)– entails the dangerous possibility of sailing adrift through the vast ocean of online information.

Dominican Republic students have the lowest levels in Reading, Mathematics and Science of the Latin American Region. PISA test results show that 70.7% of all 15 year-olds have below- minimum proficiency for the established requirements in the three subjects mentioned above (OECD, 2016a). These results coincide with those from the Third Regional Comparative and Explanatory Study (TERCE) at the primary level (UNESCO, 2016). Low quality learning is not only a matter of personal wellbeing. Lynch (2015), in his report for the "Washington Center for Equitable Growth" concludes that citizens' development with an elevated level of cognitive ability would significantly increase the economic growth of a country.

Although several authors propose that the use of technology does not necessarily affect learning processes (Cassany, 2012; Fernández-Cruz & Fernández-Díaz, 2016), "the real challenge… is how to use it" (Drucker, 2004: 269). Most Latin American educational systems, including the Dominican Republic, focus on narrowing the digital gap by accessing the Internet through broadband and digital tools for students and teachers in the schools located in areas with the lowest income (CEPAL, 2013).

Van-Deursen and Van-Dijk (2010) state that countries that have reduced obstacles to access the digital world have focused on developing digital skills rather than accessing technology. This lack of digital competence creates a "new gap" that is even more dangerous as it tends to disguise the absence of basic proficiency, such as reading. At the same time, it increases social inequalities as well as being a powerful placebo that distorts the objectives of the educational systems.

Choque-Aldana (2009) proposes that researchers assess the multidimensional phenomenon of the digital gap: the width that established the dimensions between the number of people with access to a specific technology and its depth. In other words, it is a matter of motivation, learning and integrating "digital life" with real life.

1.1. Generation Z

The term Generation Z was adopted by Schroer in 2008 to designate those born after the millennium. Their main characteristics are: "1) Experts in technological comprehension; 2) Multitaskers; 3) Socially extroverts in virtue of technologies; 4) Quick and impatient; 5) Interactive; 6) Resilient" (Fernández-Cruz & Fernández-Díaz, 2016: 98). Also, this generation has spent more time in school than have Generation X parents and teachers. A number of metaphors have been created to describe the use of ICTs. Perhaps one of the most used is Prensky's (2001) native and immigrant digitals. Date of birth does not evidence a standard generation, nor is the common use a dichotomous classification (Jones & Binhui, 2011). Furthermore, there are other factors such as tools, location and access space to the Internet. Thus, by using the White & Le-Cornu (2011) metaphor, Generation Z could be visitors or residents.

Research focuses on the secondary level which is the last opportunity for the pre-university educational system to contribute to the learning process. Therefore, it is an opportunity that affects the quality of life of young adults who failed to develop basic competency in primary school (Bravo, Dante, & Osvaldo, 2002; Slavin, Chambarlain, Daniels, & Madden, 2009). Several neurological studies prove that new neurologic connections, those in charge of executive functions, are still being formed in the prefrontal area of the brain until the age of 25 (Blakemore & Frith, 2011), hence, it is an extremely sensitive learning-phase.

1.2. Reading competence

The Organization for Economic Cooperation and Development (OECD) conceives reading as the bases for a full and active life in all aspects of contemporary society: economical, political, in community and cultural. OECD states that without reading competence, human beings cannot become emancipated neither develop in the western society (OECD, 2005; 2010; 2016a).

The information society demands new ways of literacy. Reading is no longer conceived as a school practice focusing on cognitive processes, decoding symbols and reading comprehension. Reading is a multidimensional concept that is developed throughout our lives; objectives are set by the reader in a specific sociocultural context.

Therefore, reading includes "a wide range of knowledge, social practices, values and attitudes related to the social use of written texts in each community" (Cassany & Castellà, 2010: 354).

Generation Z is inserted in a reading culture with access to new resources and new formats for learning, recreation, communication, and interaction with society. Kalantzis, Cope, Chan and Dalley-Trim (2016), as well as other authors (Lanham, 1995; Knobel & Lankshear, 2014; Plester & Wood, 2009; Van-Deursen & Van-Dijk, 2010), propose that literacy be a construction process with meaning by using multimodal symbols –oral, written, visual, gesture, touching and spatial– which may be combined or alternated to naturally represent reality.

Cerrillo-Torremocha (2005) suggests that given the characteristics of this new century (changes in communication, globalization, multiculturalism, new formats and textual genre…) at least two types of readers could be considered. The first uses reading for its cognitive, cultural, social and emotional development; this reader demonstrates communication skills and moves with ease between what is "physical" and "digital" depending on the purpose and sociocultural context, to be defined as reader. However, there is another who, despite having contact with written codes, due to a variety of reasons, does not use it for their integral development; rather this person prefers information in graphic formats, short texts, normally writes and reads to communicate and be informed, such people can be considered the neo-illiterates of the 21st century, "illiterates who can read," but cannot construct meanings by means of said practice (Salinas, 1967).

Young people who read using a digital platform, but who have inadequate reading competence, may be considered the new, 21st century illiterates. Even if they are in continual contact with information sources, they fail to develop maximum cognitive potential. This will have a negative impact on a country's economic and social growth. Describing Generation Z digital reading practice and reading literacy proficiency, which are currently at a secondary level, provide opportunities for improvement. However, of the factors studied, the educational sector is the most influential. This coincides with the PISA results.

1.3. Digital reading

The term "digital literacy" refers to a combination of texts and other multimedia resources that are only available within an electronic context (Knobel & Lankshear, 2014; 2011; 2010). Not all texts that are read on screens are considered digital. These texts must meet at least two characteristics: integration of different reading modalities patterns –oral, written, visual, gesture, touch screen and spatial– and with a different connection forms between the texts, such as, hyperlinks (MECD, 2010).

Plester and Wood (2009) consider the concept of literacy ampler than just written communication since it includes formats which allow ideas to be communicated through other means, whether visual, spatial, audio or a combination of all including videogames. Generation Z does not usually establish major differences between one format and another.

Digital texts not only constitute another classification, but as Nicholas (2011) describes, they are changing the way we read and think. This author argues, like McLuhan (1964) that the environment constitutes the thinking process and therefore, modifies it with multiple tools, how one participates in society and for example, the teaching-learning processes, communication, trade, etc.

McKenna, Conradi, Lawrence, Jang and Meyer (2012) propose a taxonomy to evaluate reading practice that takes into account academic or recreational purposes, including social media, and the reading format, digital or print. However, in this study, social media is not classified as being for recreational purposes since young adults use it to communicate and belong to a social group (Colás-Bravo, González-Ramírez, & de-Pablos-Pons, 2013).

1.4. Purpose and objectives

The purpose of this research is to describe digital reading practice in Dominican teenagers between 14 and 17 years of age and its relation with their reading literacy proficiency level. This study focuses on two contexts, public and private schools. It also proposes ideas regarding the use of the ICTs in the Latin American and Caribbean educational systems.

2. Material and methods

This research is descriptive and correlational since it first describes digital reading among young adults between 14 and 17 years of age. Moreover, public schools were compared with private schools regarding the proficiency level of reading literacy.

2.1. Participants

The student population enrolled in secondary school in the Dominican Republic includes 574,574 students. 78% of these attend public schools, and 2% are at semiofficial centers while the remaining 20% attend private schools. 382 students participated in this research; they were enrolled in their fourth year of secondary school (10th grade) at both public and private. Participants were from the provinces of Santo Domingo and Santiago and ranged between 13 and 18 years of age (M=15.15; D.T.=.85).41% were males (n=156), and 59% were females (n=226). 71% attended public schools and 29% private ones. The stratified sample has been selected based on a percent distribution of the population and their traits using a non-probabilistic quota method. The reliability level was established at 95% (Z=±1.96) and a margin for error of ±5. 13 schools were selected, of which 8 were public and 5 private. Students were selected randomly in each school using a drawing.

2.2. Instruments

Both instruments used were presented to expert opinions and pilot trial.

2.2.1. Reading practice scales

Reading frequency was evaluated using a scale based on various surveys (CERLALC-UNESCO, 2011, 2014; MECD, 2010), the taxonomy proposed by McKenna, Conradi, Lawrence, Jang and Meyer (2012) and the recommendation of Colás-Bravo and others (2013) regarding the use of social networks. The general scale features 24 items. These were distributed depending on the reading format –digital and print– and the purposes: academic, recreational, for communication and participation. A Likert scale was used, with a range between 1 and 5, where 1 corresponds to "never" and 5 is "always" and a dichotomic question about textbook format preference: digital or printed copy. To facilitate the analysis, answers were grouped into three categories: low (1 and 2), intermediate (3) and high (4 and 5). Only the complete sub-scale for digital reading (14 items) is reported and two items for the academic printed format, use of textbooks and dictionaries that allow a comparison in the format preference.

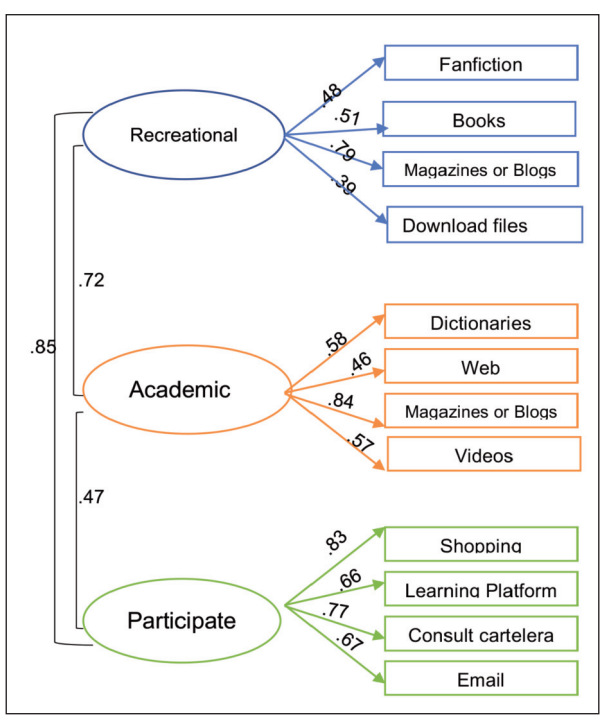

Figure 1. Final diagram of the confirmatory factorial analysis (modified).

Figure 1 shows the final path diagram of the Confirmatory Factor Analysis (CFA) using SPSS Amos V.24. Three latent variables were considered together with their respective items (observable variables): recreational, academic and participation. Twelve factors constituted the digital subscale.

The model adjustment was determined by the maximum likelihood method. Firstly, four latent variables were

tested: recreational, academic, social network and participation. During the first adjustment, the "social network" variable was eliminated.

Some of the factors have a weak effect on the latent variable that was taken into account during the results analysis. However, the model proves to be an adequate adjustment: χ^2(51, n=364) 102.17, χ^2/gl.=2.00 thus explaining 93% of the data variance. Other indexes have also proven the adequate adjustment: GFI (Goodness of Fit Index) =.96 and the AGFI =.94, the CIF=.93 and the RMEA=.051 [.037 – .066]. The measurement of errors obtained fall within the expected range. The social desirability bias and possible comprehension errors in the items due to students' low proficiency level of reading literacy proved in the Pilot Trial was avoided by using the Pitcher and collaborators (2007) interview technique. Evidence of the responses was requested and based on these, the questionnaire with the participant's responses is either confirmed or corrected. The reliability of the instrument was evaluated with Cronbach's Alpha: academic α=.65; recreational α=.51 and participation α=.65. All were considered acceptable.

2.2.2. Reading competence assessment (CoLeP Test)

The reading literacy proficiency level is distributed into five levels by an "ad hoc" test, based on a text liberated by PISA, which uses the Rasch model. The value of the parameter and all other technical specifications were extracted from OECD (2000; 2002; 2012) technical reports and incorporated into a correction handbook designed for this study. For each level, an 80% correct answer cutoff was established.

The test allows performance in three activities to be identified: location, integration and evaluation. Five different texts are presented; three are continuous –descriptive, expository argumentative– and two discontinuous – exposition and diagrams. After validation from experts and a pilot trial, the final version was constituted to include 22 items. An acceptable reliability of α=.81 was obtained. Each text has four to five questions. Thirteen multiple-choice questions, six open-ended and three double-entry tables were provided. Once the instrument was applied, an analysis was performed to determine abnormal cases; in other words, those that failed to meet the condition of the Rasch model. 4.5% of the sample (n=18) was eliminated, which is within the range considered reasonable and valid.

2.3. Procedure

A Reading Competence Assessment Test (CoLeP from the abbreviation in Spanish) and Reading Practice Scales (EPL) were integrated into a single answer booklet to facilitate its use in the classroom. The pilot trial established an application range between 40 to 90 minutes. Students were offered all sorts of information about the research and accepted their participation as volunteers. As the group tests concluded (CoLeP and EPL), each student was given a number for the individual verification interview. The interview location varied for each school depending on the availability of space. During the interview, students were asked for permission to be recorded. 8% (n=31) refused permission, but they were interviewed. Data were processed using SPSS V.21 statistical software. Before the analysis, data were subject to various tests such as: detecting atypical cases for each variable and establishing its impact, examining lost cases, diagnosing randomness of absent data, verifying the normality of each variable, verifying the uniformity of the variance and verifying the linearity of the relations. The analyzed sample was constituted with 364 subjects. The data analysis began with descriptive statistics. ANOVA allowed us to determine whether there was a significant difference among the sectors depending on digital reading practices and the Pearson Correlation Coefficient, the link between them and reading proficiency.

3. Analysis and results

77% (n=282) of Dominican students in their fourth year of secondary school (10th grade) are below Level 3 in the CoLeP Test. In other words, they fail to have the reading competence skills that the society of today demands. 9% (n=33) fail to reach minimal levels, while 45% (n=164) fall within Level 1 and 23% (n=85) at Level 2.

There is a significant difference based on the schooling sector, F (5, 13.25) =15.7, p=.000. Figure 2 shows that 84% of the students in the public sector lack minimal proficiency reading proficiency while in the private sector, only 25% are lacking such proficiency. Private school students have the highest reading proficiency. There are no significant differences between males and females F (5, 1.63)=1.35, p=.240.

Almost all students, 97% stated that they use the Internet, 86% accessing it from home. The most commonly used tool is a cell phone. There is greater use in the public sector (61%) than in the private sector (45%); in this

latter sector, there are a significant number of students who use a tablet (18%). Only three students with reading competency below minimal levels stated they had no connection; two were from the public sector and one from the private.

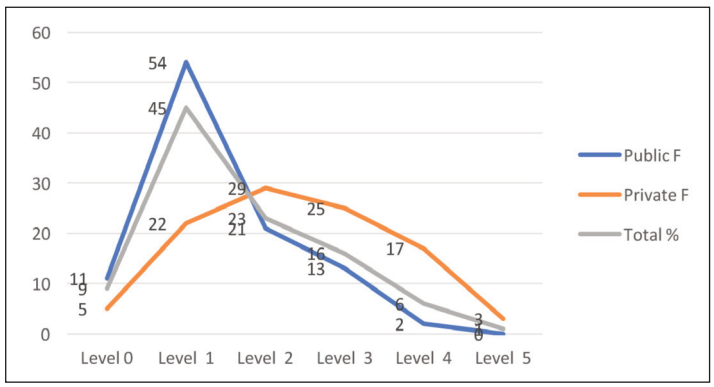

Figure 2. Percentage distribution of Reading Literacy Proficiency Level by educational sector.

There were no significant differences between the public and private sectors with regards to academic digital reading frequency, F(1, .439)=.361, p=.548 nor in the use of social networks, F(1, .378)=1.92, p=.166; but there was a difference in recreational use, F(1, 18.41)=21.51, p=.000 and instrumental use, F(1, 38.12)=66.1, p=.000. Table 1 shows the private sector in which 29% had high recreational reading practice, while in the public sector, this was only 12%. 50% use the Internet for instrumental activities while in the public sector, it was only 14%.

Table 2 shows that consulting websites is the most frequent Internet activity by students, and for academic purposes, well above consulting texts in a printed format. The purchase power factor has been ruled out, as the Ministry of Education in the Dominican Republic (MINERD) provides free books at public centers. Likewise, there is a significant difference in the preferred use of the digital dictionary over the printed version. It is noteworthy that videos are viewed extensively as complementary to teaching expositions. Despite the ample use of the Internet for academic purposes, more than half (52%) continued to prefer a printed textbook.

There were no significant differences between the public and private sector when it came to downloading files for recreational purposes. However, there were significant differences between the two types of centers for reading Blogs or books at the .05 level, with the private sector showing greater frequency.

This differential between sectors for the instrumental use of the Internet could be influenced by user purchasing power and the parameter (λ) of the items in the sub-scale. For example, consulting billboards (λ=.77) and on-line shopping (λ=.84) are two items with increased weight in the sub-scale for digital reading (Figure 1); this leads one to presuppose a certain amount of affordability. On the other hand, using a virtual learning platform (λ=.66) had no direct dependence on the user, but rather, the educational context. Virtual learning is not available in the public sector while it is in private educational centers. Lastly, the use of email (λ=.67) shows no significant difference between sectors (Table 2), which usually depends on the user and the Internet access.

Depending on the educational sector, there are significant differences at the Reading Literacy Proficiency level with this factor showing the strongest positive relationship. No relationship was found between digital academic reading and student reading proficiency level (r_p=.–032). The weak yet positive relationship between recreational and instrumental reading might probably be due to the significant differences of these uses and the reading competence of the reader as per sectors (Figure 3).

4. Discussion and conclusions

The Dominican Republic's Generation Z living in urban areas, including the marginal areas, have access to the Internet thanks to a number of devices with a strong trend favoring handheld devices. This datum coincides with the World Bank, which established the number of people with cell phones was 82% in 2016. The most frequent use is for recreational and

Table 1. Internet Use by Generation Z as a Percentage of the Sample

	Public (n = 262)				Private (n = 102)			
Sub-scales	**Low**	**Medium Low**	**Medium High**	**High**	**Low**	**Medium Low**	**Medium High**	**High**
Academic	25	24	29	21	28	27	21	24
Recreational	20	41	28	12	7	34	29	29
Instrumental	0	60	26	14	0	25	25	50
Social Networks	3	14	0	84	3	6	0	90

social communication purposes, but there is also an elevated use for academic reasons, which would imply unprecedented cognitive development. Nevertheless, 17 years ago, Millán (2000), warned that this access would not necessarily produce the expected effects if people fail to have adequate reading levels. This is the case a high percentage of Dominican students who have below minimal requirement; the oxymoron effect appears, because despite having the potential to access quality academic sources, its use fails to lead to meaningful and autonomous learning.

Table 2. Digital sub-scale factors per educational center as percentage of the sample

	Educational Centers (EC)					
	Public (n = 262)			Private (n = 102)		
	Low	Medium	High	Low	Medium	High
Academic						
Dictionaries	7^a	21^a	71^a	7^a	25^a	69^a
Web	4^a	13^a	83^a	1^a	5^b	94^a
Magazines or blogs	24^a	29^a	46^a	22^a	33^a	44^a
Videos	17^a	27^a	55^a	22^a	32^a	46^b
Recreational						
Download files	6^a	18^a	74^a	6^a	12^a	82^a
Books	28^a	28^a	44^a	11^b	27^a	61^b
Fanfiction	79^a	8^a	12^a	59^b	16^b	24^b
Magazines or blogs	36^a	32^a	31^a	29^a	28^a	42^b
Video	6^a	21^a	73^a	5^a	8^b	87^b
Participate						
Email	46^a	23^a	31^a	25^b	35^b	39^a
Consult	45^a	33^a	20^a	28^b	35^a	36^b
Virtual Platform	65^a	21^a	14^a	41^a	22^a	37^b
Virtual Shopping	76^a	15^a	9^a	34^a	23^a	43^b
Social Networks	3^a	14^a	84^a	3^a	6^b	90^b
Academic printed						
Text Books	14^a	40^a	46^a	15^a	34^a	51^a
Dictionaries	27^a	34^a	39^a	48^a	30^a	22^a

Note: Each superscript letter indicates a sub-set for the EC categories, the column proportions do not differ significantly between each other at level .05.

There is a significant gap in reading literacy proficiency levels among students who study in the public and the private sector. In turn, this deepens social-economic inequalities while at the same time undercutting opportunities for the most vulnerable sectors of society. The Matthew effect is being produced, as described by Stanovich (1986) to explain the individual differences in acquiring reading competence and the influence of the social-cultural context and one's own life history. A student with prior knowledge and one who lives in a literate culture will more efficiently incorporate what one has read while at the same time enriching one's reading experience. It is a matter of the "rich get richer." On the contrary, a student with limited prior knowledge and who is not immersed in a reading culture, even if the person reads a lot and uses ICTs, that student will be unable to efficiently incorporate the information; therefore, he/she will continue to be disadvantaged. In summary, the "poor get poorer."

The frequent use of social networks by most students, regardless of gender, coincides with the study by Colás-Bravo and others (2013) of young people from Andalusia (Spain). There is evidence of a change in how adolescents recreate, learn and communicate with no differences between social sectors. Textbooks are not the primary or single source of information or culture, as youth tend to prefer multimodal contents and there are fewer who use written codes to access information. The use of videos to complement the teacher's explanations, the download of music and films confirm this fact, but even so, it is risky to understand the current generation as a standardized group in terms of preference and skill in digital practices. Age is not the best criteria as not all of them prefer nor uses such resources in a similar manner, as proven by the data. Further qualitative studies are necessary to deepen into the skill,

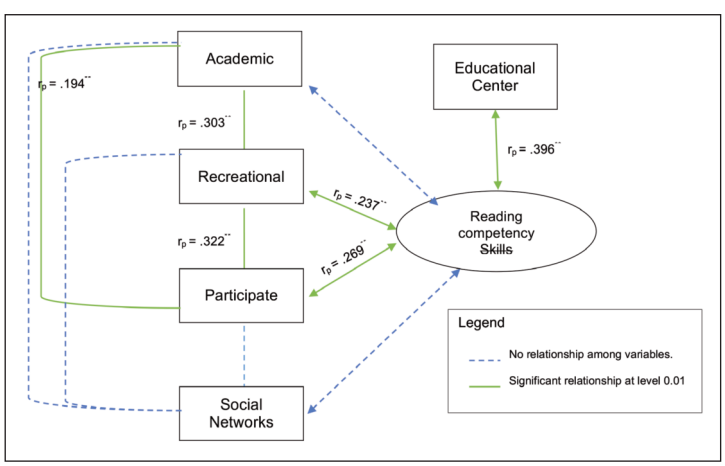

Figure 3. Relationship among the variables studied.

motivation and context of the Internet use by the Generation Z to confirm that the majority may consider that there are more visitors than residents, as indicated by a metaphor from White & Le-Cornu (2011).

Students' use of Internet, even for academic purposes, seems to be insufficient to develop the necessary reading or digital competence. There is a need for further studies that ponder teachers' technological and pedagogic competence, which could be the key (Fernández-Cruz & Fernández-Díaz, 2016) to undertaking more intense interventions where technologies accompany teaching and learning strategies to generate the appropriation of knowledge on behalf of students through productive, experiential and communicative learning activities (Marcelo, Yot, & Mayor, 2015).

Young people who read using a digital platform, but who have inadequate reading competence, may be considered the new, 21st century illiterates. Even if they are in continual contact with information sources, they fail to develop maximum cognitive potential. This will have a negative impact on a country's economic and social growth.

Describing Generation Z digital reading practice and reading literacy proficiency, which are currently at a secondary level, provide opportunities for improvement. However, of the factors studied, the educational sector is the most influential. This coincides with the PISA results (OECD, 2016b). Thus, the Ministry of Education must carry out interventions in those schools with the lowest proficiency of reading competence to develop critical and fully functional citizens.

The digital gap in the Dominican Republic is deeper than it is wide. ITCs provide great potential to bring students closer to the necessary knowledge for the 21st century. Nevertheless, users must have the necessary reading and digital competence. Without these, they will be sailing adrift through a sea of information.

The digital gap in the Dominican Republic is deeper than it is wide. ITCs provide great potential to bring students closer to the necessary knowledges and skills for the 21st century. Nevertheless, users must have the necessary reading and digital competence. Without these, they will be sailing adrift through a sea of information.

Funding Agency

This research was financed by INAFOCAM-Instituto Nacional de Formación y Capacitación del Magisterio (National Teacher Education and Training) and IDEICE-Instituto Dominicano de Evaluación e Investigación de la Calidad Educativa (Dominican Institute for the Assessment and Research of Quality Education).

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