ORIGINAL

http://dx.doi.org/10.22480/rev.unifa.v30n2.423.ing

Level of schooling and its impact on the training course of 64 Infantry Battalion soldiers

Nivel de escolaridad y su impacto en el curso de formación de los soldados del Batallón de Infantería-64

Nível de escolaridade e seu impacto no curso de formação dos soldados do Batalhão de Infantaria-64

Erick Antonio Silva[I]

ABSTRACT

The new Strategic Plan for **Air Force 100** is a broad process of restructuring of Aeronautical Command (COMAER). Among the areas of action, the refinement of human resources management is highlighted, with emphasis in the fields of recruitment, selection and training. Immersed in this triad, the aim of this study was to verify the influence of soldiers' level of schooling during the recruitment stage on the degree of performance obtained at the end of the Soldiers Training Course (CFSd) of 2015 and 2016 teams of the 64 Infantry Battalion (BINFA-64). Directing the discussion, the Theory of Meaningful Learning (TAS) was chosen, which interprets the construction of the individual's cognitive structure and emphasizes that knowledge preexisting in learners' mental framework acts as an anchor of knowledge (Subsumption), serving as a support to formation of new knowledge. The Mapping of the research objective was established in two aspects. In the foreground, basing and validating the schooling level records of the 421 soldiers under study was sought at the time of the incorporation. It was verified that the military had complete elementary school degree (3%), incomplete secondary school degree (17%), complete secondary school degree (66%), complete secondary school degree (10%) and incomplete higher education degree (4%). Under another perspective, the research focused on recording the soldiers' final performance score at the end of the course. School and performance data collected were statistically compared using the Pearson coefficient. The value of 0.85, tested by the coefficient, indicated a strong correlation among the variables. Associated with TAS precepts, from this result it was concluded that the highest performance scores corresponded to the highest school levels.

Keywords: Training course for soldiers. Level of schooling. Performance. Theory of meaningful learning.

RESUMEN

*La nueva Concepción Estratégica **Fuerza Aérea 100** comprende un amplio proceso de reestructuración del Comando de la Aeronáutica (COMAER). Entre las vertientes de acción, se destaca el refinamiento de la gestión de los recursos humanos con énfasis en los campos de reclutamiento, selección y formación. En este sentido, el trabajo tuvo como objetivo verificar la influencia del nivel de escolaridad de los soldados, durante la etapa del reclutamiento, en el grado de rendimiento obtenido al término del Curso de Formación de Soldados (CFSd), de las clases 2015 y 2016 del Batallón de Infantería-64 (BINFA-64). Para guiar la discusión, se eligió la Teoría del Aprendizaje Significativo (TAS) que interpreta la construcción de la estructura cognitiva del individuo y resalta que los conocimientos preexistentes en la estructura mental del aprendiz actúan como anclas del conocimiento (subsunsores), sirviendo de subsidio a la formación del aprendizaje del nuevo saber. El mapeo del objetivo de la investigación fue establecido en dos vertientes. En primer plano, se buscó fundamentar y validar el registro del nivel de escolaridad de los 421 militares bajo estudio, en el instante de la incorporación. Se constató de la muestra que los militares poseían los niveles de educación fundamental completo (3%), medio incompleto (17%), medio completo (66%),*

I. Aeronautical Logistics Institute (ILA) – Guarulhos/SP – Brazil. Major of Infantry of Brazilian Air Force (FAB). E-mail: tenerick@gmail.com
Received: 09/22/2017 Accepted: 11/23/2017

The acronyms and abbreviations contained in this article correspond to the ones used in the original article in Portuguese.

medio técnico (10%) y superior incompleto (4%). En otro plano, la investigación enfocó el registro del grado final de rendimiento de los soldados, al término del curso. Los datos escolares y de rendimiento recopilados fueron tratados estadísticamente, por intermedio del coeficiente de Pearson. El valor de 0,85, experimentado por el coeficiente, indicó una fuerte correlación entre las variables. Asociado a los preceptos de la TAS, de ese resultado se concluyó que los mayores grados de rendimiento correspondían a los niveles escolares más elevados.

***Palabras clave**: Curso de formación de soldados. Nivel de escolaridad. Rendimiento. Teoría del aprendizaje significativo.*

RESUMO

*A nova Concepção Estratégica **Força Aérea 100** elenca um amplo processo de reestruturação do Comando da Aeronáutica (COMAER). Entre as vertentes de ação, destaca-se o refinamento da gestão dos recursos humanos com ênfase nos campos de recrutamento, seleção e formação. Imerso nessa tríade, o presente trabalho teve como objetivo verificar a influência do nível de escolaridade dos soldados, durante a etapa do recrutamento, no grau de desempenho obtido ao término do Curso de Formação de Soldados (CFSd), das turmas 2015 e 2016 do Batalhão de Infantaria-64 (BINFA-64). Norteando a discussão, elegeu-se a Teoria da Aprendizagem Significativa (TAS) que interpreta a construção da estrutura cognitiva do indivíduo e ressalta que os conhecimentos preexistentes no arcabouço mental do aprendiz atuam como âncoras do conhecimento (subsunçores), servindo de subsídio à formação do novo saber. O mapeamento do objetivo da pesquisa foi estabelecido em duas vertentes. Em primeiro plano, procurou-se fundamentar e validar o registro do nível de escolaridade dos 421 militares em estudo, no instante da incorporação. Constatou-se da amostra que os militares possuíam os ensinos fundamental completo (3%), médio incompleto (17%), médio completo (66%), médio técnico (10%) e superior incompleto (4%). Sob outro plano, a pesquisa enfocou o registro do grau final de desempenho dos soldados, ao término do curso. Os dados escolares e de desempenho levantados foram confrontados estatisticamente, por intermédio do coeficiente de Pearson. O valor de 0,85, experimentado pelo coeficiente, indicou forte correlação entre as variáveis. Associado aos preceitos da TAS, desse resultado concluiu-se que os maiores graus de desempenho corresponderam aos níveis escolares mais elevados.*

***Palavras-chave**: Curso de formação de soldados. Nível de escolaridade. Desempenho. Teoria da aprendizagem significativa.*

1 INTRODUCTION

Current situation in our country is increasingly emphasizing the importance of educating its people. Social relations, violence, economic development, among other aspects, are closely linked to the population's intellectual level (FRANCISCO FILHO, 2012, p. 105). Such relevance is the stimulus of numerous programs and investment by governmental authorities.

In line with this concept, the Brazilian Air Force (FAB) promotes teaching at several levels and ends up proving to be a faithful extract of society. In this way, their education efforts share the same positive results as national programs do. Reinforcing this idea, the new Strategic Plan for **Air Force 100** establishes its view that,

> Human resources management shall improve recruitment and selection processes, focusing on training [...], aiming at raising knowledge that includes intellectual, cultural and analytical levels of its members. (BRASIL, 2016, p. 34).

Especially in lower levels of education, emphasis on education becomes even more evident in government actions such as Government National Youth Inclusion Program (Projovem) and the Brazil Literacy Program (PBA), managed by Ministry of Education (MEC). Comparatively at FAB such a portion of society can be represented, to a lesser extent, by soldiers. These make up the effective of the diverse sections and service stations of Military Organizations (OM).

At this level, the main educational entities are the Infantry Battalions (in the process of restructuring for the Security and Defense Group – GSD), as they are responsible for the initial training of these soldiers. Results of this training are clearly observed in their work performance in the various OM sectors, as well as garrison stations and gates, key safety links and an identifying mark for the external public.

As an example, the author presents for discussion, due to the relevance of his work experience, the Mará-Obi Infantry Battalion (BINFA-64) due to this one promoting military training for soldiers at the Air Force Garrison in the city of São José dos Campos (GUARNAE-SJ).

The Soldiers Training Course (CFSd,), lasting four months, prepares youths enlisted for the exercise of military activities. At the end of the course, soldiers are assigned to an OM, according to an assignment table. Minimum curriculum provides, in addition to specific

activities, the performance evaluation at the end of the period. And this assessment reflects much of its competence in the performance of future tasks in the various sectors of the Garrison OM.

Among the factors that incidentally interfere in the result obtained in that evaluation, this author's interest was evoked by his research problem: What is the influence of BINFA-64 soldiers' education level by the end of the initial training period? Without loss of generality, the scope of the study was restricted to the 2015 and 2016 groups since it intends to gather a significant sample of a current group of military personnel after recent changes in the selection process proposed by the Regulatory Instructions of Soldiers Personnel (BRASIL, 2014, p. 5).

Guiding this study, the following hypothesis is presented: Has the soldiers' level of schooling at the time of the initial selection had an influence on the performance level at the end of BINFA-64 2015 and 2016 teams' training course.

With the purpose of ratifying (or refuting) this hypothesis, it was chosen, as the General Objective (OG) of the research, to verify the influence of the soldiers' level of schooling in the performance score evaluated at the end of the Marás-Obi Battalion 2015 and 2016 teams' Soldiers Training Course.

The OG reach is followed by means of Specific Objectives (OE) aiming to explore each segment of the General Objective, knowingly:

OE1 – to identify the initial selection process criteria for conscripts at the Mobilizing Section (SMOB-48), according to the Initial Military Service rules;

OE2 – to record the education level and the courses included in the Conscripts' Selection File (FSC);

OE3 – to identify the performance assessment requirements included in the CFSd minimun curriculum in making up the final score obtained by the military and;

OE4 – to verify the overall score and the scores obtained in theoretical and practical tests in the CFSd.

In view of the thoughts presented on education, as well as the proposal for analysis of soldiers' schooling profile characteristics (technical training), as some factor influencing future professional performance, it is observed that the research line most aligned with this study is the education at FAB.

The relevance of this study can be described in some points. First off, the research is likely to have its scope of analysis extended to soldiers in other BINFA/BINFAE/GSD at FAB. Secondly, the possibility of improving recruitment processes by selecting a distribution of soldiers that is more adequate to the observed performance characteristics. Thirdly and finally, to promote future work to incorporate teaching instructions into the battalions' Weekly Work Schedule (QTS). Such study for improvement of human resources is presented at a favorable occasion in view of the new Strategic Plan for the **Air Force 100**.

2 METHODOLOGY

This study has been developed as a descriptive research (GIL, 2002), combining and has mixed both qualitative and quantitative techniques, due the two work fronts, outlined below, in order to reach its objective. The first one of them, as a survey nature, addressed the soldiers' initial selection process at SMOB-48, held at the Department of Aerospace Science and Technology (DCTA). Conscripts' selection process stages and the Complementary Selection Committee's procedures were verified, as determined by the Regulatory Instructions of Soldiers Personnel (BRASIL, 2014), in order to comply with OE1. Emphasis was given to the information gathered and recorded from the youth enlisted, especially concerning the schooling level qualitative standard.

Under a different scope, the study was developed on the document research (GIL, 2002) on the Soldiers' Training Course minimum curriculum, in order to identify the systematic formulation of the performance assessment process at the end of the course, in compliance with OE3. Such effort has allowed the identification of the course assessed instructions, the theoretical tests, the practical tests and the weight of evaluations in calculating the course final scoring.

Due to the research study scope, in view of the several enlisting stages, this work aimed to study the universe regarding the 2015 and 2016 first and second teams, encompassing the soldiers' four incorporation processes for active service at FAB. The study reached the whole teams effective, representing 421 military persons.

According to the Conscripts' Regulation for Initial Military Service (BRASIL, 2003, p. 14), records of professional skills and schooling were included in the systematic assessment of the conscripts (item 4.5.1), among other data stored at the time of enlisting. Such measures allowed to split the data into categories, considering complete or incomplete schooling degrees and presence or not of technical courses and extra academic activity.

According to the Conscripts' Selection Files (BRASIL, 2016, p. 62), it was possible to distribute and score the schooling level in categories of analysis, as per Table 1.

Table 1 - Categories of schooling levels.

Acronym	Level of schooling	Points
FI	Incomplete elementary school degree	0
FC	Complete elementary school degree	1
MI	Incomplete secondary school degree	2
MC	Complete secondary school degree	3
MT	Technical secondary school degree	4
SI	Incomplete higher education degree	5

Source: The author.

Added to the score related to the schooling level, it was considered, under the terms of FSC, an increase of 0.25 points for each Extra Academic Activity course above 40 hours/class carried out by conscripts. Therefore, it was possible to stratify the learning degree to study the influence of the conscripts' cognitive structure in their CFSd final performance.

The research delineation was established by surveying the soldiers' schooling and skills data in each team at the SMOB-48 database, organized as a Microsoft Excel spreadsheet, which is the OE2 focus. To this database were added the respective scores of each military person, according to assessments provided for in the curriculum, applied by the instructors and recorded at the Military Instruction Section, which is the sector responsible for managing the course. Such action aimed to acquire quantitative data from the scores obtained by the military personnel during training to reach OE4.

Therefore, it was possible to compare the soldiers' knowledge acquired before the training course with results obtained in assessing their performance at the end of the course. The personal cognitive structure of these military personnel was the focus of analysis, under the Ausubelian Subsumption, as preexisting relevant concepts in individuals' structures which influence the military personnel's learning processes. The counterpart of this influence occurred in its correlation and adherence to the final performance score, at the end of the CFSd, guiding the verification of the influence proposed by the OG.

To support the existence of a relationship between these two variables, the present study was based on the analysis of Pearson correlation coefficient (ρ). Considering two variables x and y, such coefficient is expressed by Equation 1.

$$\rho = \frac{\text{Covariance (x, y)}}{\sqrt{\text{Variance (x)}} \cdot \sqrt{\text{Variance (y)}}} \qquad (1)$$

Where,

$$\text{Covariance } (x, y) = \sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})$$

$$\text{Variance } (x) = \sum_{i=1}^{n} (x_i - \bar{x})^2$$

and

$$\text{Variance } (y) = \sum_{i=1}^{n} (y_i - \bar{y})^2$$

On what,

$$\bar{x} = \frac{1}{n} \cdot \sum_{i=1}^{n} x_i \qquad \text{and} \qquad \bar{y} = \frac{1}{n} \cdot \sum_{i=1}^{n} y_i$$

The ratio between the cross-covariance of the variables and their respective variances allows estimating a measure of association of variables. According to Descriptive Statistics, the possible values taken on by the coefficient can be interpreted according to Table 2.

Table 2 - Interpretation of Pearson correlation coefficient values.

Value	Correlation
$\rho = 1$	Perfect
$0{,}9 \leq \rho < 1$	Very strong
$0{,}7 \leq \rho < 0{,}9$	Strong
$0{,}5 \leq \rho < 0{,}7$	Moderate
$0{,}3 \leq \rho < 0{,}5$	Weak
$0 \leq \rho < 0{,}3$	Negligible

Source: Adapted from Montgomery and Runger (2009).

The method presented as a limitation the fact that, due to the collection of the scores obtained in the evaluations including 4 classes, the tests applied for the same discipline can differ in difficulty among the teams. In addition, the Conscripts' Regulation for Initial Military Service (BRASIL, 2003) provides that the selection process must have preference in enlisting conscripts with a complete elementary school degree. Thus, in view of the age of the enlisted youth, there was a certain tendency to present level of education as high school.

3 THEORETICAL FRAMEWORK

Incorporating soldiers at FAB for an initial military service provision is carried out by means o0f recruitment and selection processes. Likewise, the expressions are defined by Chiavenato (2003, p. 53),

> Recruitment aims to supply the selection process with candidates. And selection aims to choose and rank candidates suitable to the needs of an organization. Also in the process of selecting human resources.

It is also highlighted that,

> [...] character, intelligence, skills, mental abilities, etc. lead people to behave differently (with greater or lesser success) in organizations. People differ in both their **ability to learn a task** and how to do it. (CHIAVENATO, 2003, p. 85, emphasis added by the author).

In terms of learning, Ausubel (2003, p. 155) theorizes that "[...] the most important isolated factor which influences the learning is what the student already knows [...]". In other words, the previous content has a strong influence on the process of assimilating new data by the learner. Construction of individuals' cognitive structure takes place therefore (AUSUBEL, 2003).

The cognitive structure represents all the informational content stored by the individual in any mode of knowledge (VALÉRIO, 1999). This prior knowledge shall serve as an anchor point where new information shall integrate into what the person already knows. The connection **anchor** is the concept of Subsumption, which, according to Ausubel, is made up of specific knowledge structures whose scope is related to the learner's sensory experiences. This inclusion of knowledge in the cognitive structure goes beyond, in Ronca's words (1994, p. 2), who says that:

> If new content interacts with a broader concept, the initial effects of inclusiveness shall be as much on learning facilitation as on knowledge retention itself.

From this association of interrelated information (RODRIGUES; GIRAFFA; RISSOLI, 2010) comes the process called Meaningful Learning proposed by Ausubel, whose theory bears the same name. According to the creator of the theory, meaningful learning occurs considering three necessary conditions:

1) the material to be assimilated must be potentially meaningful and substantive (having meaning for the individuals);

2) it is based on a minimal content of individuals' cognitive structure, with sufficient subsumption to anchor the foreground and

3) the apprentice demonstrates willingness to learn new content.

The necessary conditions presented for the occurrence of Meaningful Learning were narrowed in solving the research problem in this study in order to ground the discussion of the results to be obtained.

By means of the CFSd minimum curriculum, disciplines taught were investigated in order to relate the course subject matters with the (1) meaningful learning demands. The curriculum contents proved to be substantive and make sense in the context of military adaptation, in which the conscripts (military recruits) found themselves inserted. The didactic material consisted of a collection of handouts taken by means of a receipt document from the Instruction Section, being them identical for all teams.

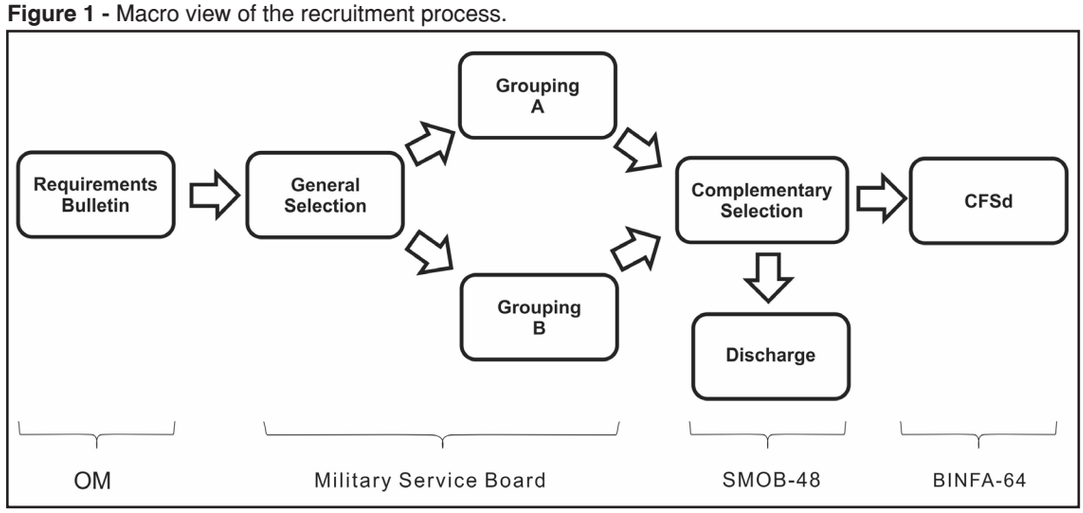
Research and investigation on soldiers' schooling level and previous experiences, a variable explored in this study, relates to TAS requirement (2). Soldiers' prior knowledge, gathered in school and out-of-school courses, has spanned the breadth of the military's cognitive structure. This structure holds the subsumption that serve as a basis for assimilation of new knowledge which, in this case, were the course military instructions.

The last condition of the theory, item (3), is related to soldiers' willingness for new experiences. Since the voluntary desire to serve the Homeland, in addition to the vocational test carried out during the individual selection interview, is understood as an attitude that is favorable to new knowledge to be acquired in the barracks activities.

4 ANALYSIS AND INTERPRETATION OF DATA

According to the Conscripts' Regulation for Initial Military Service (BRASIL, 2003, p. 12), the selection process macro view could be gathered in Figure 1.

Figure 1 - Macro view of the recruitment process.



Source: The author.

The recruitment system began with the development of DCTA's Military Organizations' Needs Bulletin (BRASIL, 2003, p. 20). This document closed the amount of military needed to attend the Personnel Assignment Table (TLP) and the gaps of military personnel caused by the licenses of soldiers teams.

Based on the information in the bulletin, the Military Service Board has established the General Selection parameters, so as to enable a military personnel that is three times greater than the needs indicated. This phase consisted of physical-medical examinations, psychological test and an interview to evaluate social and moral aspects of the conscripts and volunteers to join the military ranks. The conscripts approved in these qualifying rounds were assigned to the Mobilizable Groupings A and B, which were respectively assigned to the Complementary Selection for incorporation of the 1st and 2nd teams.

The Complementary Selection (SC) step, under responsibility of SMOB-48, was the target of the research OE1. According to the Regulatory Instructions of Soldiers Personnel (BRASIL, 2014, p. 13), this selection step has been carried out by a Complementary Selection Committee (CSC) designated to act in coordination with the Mobilizing Section. Selection consisted of the following phases:

a) definition of conscripts qualified in the general selection;

b) handing documents for curricular analysis;

c) health inspection;

d) physical fitness assessment test;

e) psychological evaluation;

f) curricular analysis;

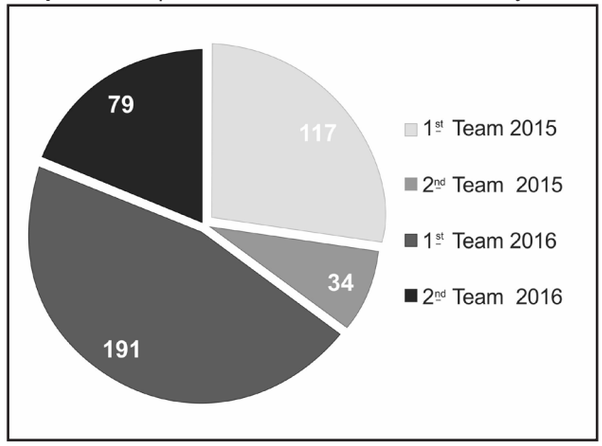
g) disclosure of the list with results obtained by conscripts and

h) incorporation to provide Initial Military Service and consequent enrollment in the CFSd.

The curricular analysis referred to in letter **f** included the verification of the level of education, courses and internships carried out as professional qualifications. This information was recorded by the committee in the Conscripts' Selection File (FSC) and compiled in a database in SMOB-48. Access to the section's database and export of the information as a Microsoft Excel spreadsheet aimed to comply with OE2. The universe of this study, involving the total of soldiers from the 2015 and 2016 first and second teams, represented 421 soldiers. The effective portion of each team can be observed in Graph 1.

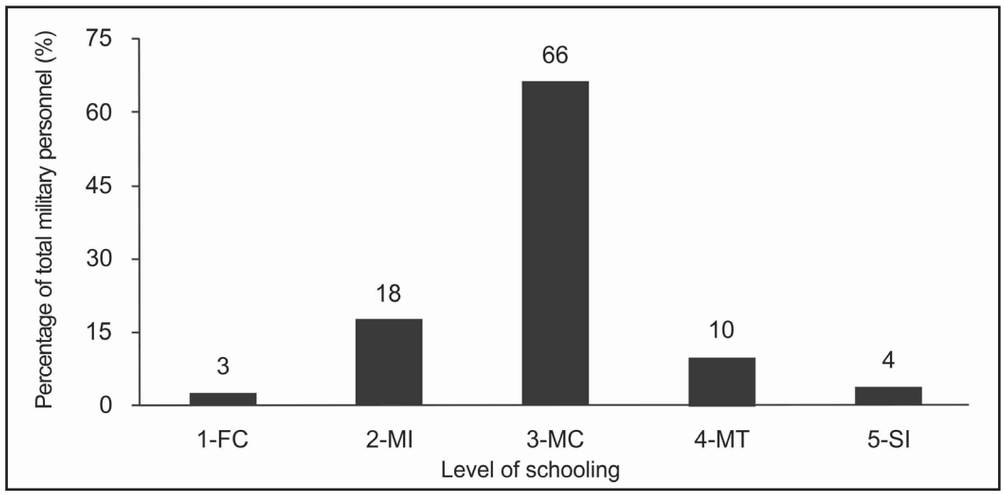
Based on the data collected, it was verified that, from an universe of 421 military, levels of schooling, as in Table 1, were distributed in the proportion described by Graph 2.

Graph 1 - Composition of the universe of research by teams.



Source: The author.

Graph 2 - Percentage of soldiers by educational level.



Source: The author.

Given the score for each level of schooling (Table 1) and considering the increase of 0.25 points per extracurricular course carried out, as designated in the Strategic Plan for **Air Force 100** (BRASIL, 2016, p. 62), it was possible to subdivide the levels of schooling, according to Table 3.

The subdivision, proposed in Table 3, aimed to better quantify the conscripts' cognitive structure, assigning a score according to the degree of their intellectual qualifications. From the point of view of TAS, greater complexity of the cognitive structure indicates greater predisposition to assimilate new knowledge.

In compliance with OE3, the fundamental aspects of the course were verified, present in the minimum curriculum (BRASIL, 2013). Emphasis was on aspects of the evaluation process, with the aim of supporting the collection of military performance degrees.

It was verified, then, that each course had approximately 17 weeks of duration and an hour load of 520 instructional times. Its structure comprised 2 phases of instructions: the Initial Phase, ending 420 times in the general and military fields, and the Basic Phase, developed in the remaining 100 times in the technical-specialized field. The subjects covered the following areas: Humanities, Aeronautical Sciences, Health Sciences, Social and Applied Sciences, Military Sciences, Engineering and Technology.

Table 3 - Subdivision of soldiers' level of schooling categories.

Level of schooling (teaching)	Number of extracurricular courses	Score	Total military personnel
Complete elementary school degree	0	1.00	11
Incomplete secondary school degree	0	2.00	59
	1	2.25	9
	2	2.50	4
	3	2.75	2
Complete secondary school degree	0	3.00	166
	1	3.25	70
	2	3.50	31
	3	3,75	12
Technical secondary school degree	0	4.00	32
	1	4.25	9
Incomplete higher education degree	0	5.00	16

Source: The author.

Subject matters were taught through lectures and practical classes, with their workloads distributed according to the General Chart of the Course (BRASIL, 2013, p. 13). The subjects with summative evaluations, expressed in terms of hours, represented 73% (380 of 520 times) of total instructional times. It was verified that a significant portion of the course workload was allocated to the instructions evaluated, as shown in Table 4.

In turn, evaluations consisted of theoretical and practical tests in the construction of the course final performance grade. As indicated in Table 4, the content and evaluations were provided in: PT1 – Theoretical Test 1; PT2 – Theoretical Test 2; PT3 – Theoretical Test 3; PTE – Specialized Theoretical Test; PP1 – Practical Test 1 and PP2 – Practical Test 2.

Based on the tests and on what is provided for in 3.1.3 of the CFSd Assessment Plan (BRASIL, 2013a), the teams' performance final score was expressed by means of the evaluations arithmetic mean, according to the Equation 2.

$$GF = \frac{PT1 + PT2 + PT3 + PTE + PP1 + PP2}{6} \quad (2)$$

In response to OE4 and complying with the condition that the TAS is established in the cognitive field, the data collection referring to the military personnel' final score proceeded in a way to unlink grades obtained in theoretical and practical tests. Analyzing the composition of the final means, it was possible to observe 67% influence of the evaluations of the cognitive domain and 33% of the psychomotor domain.

Thus, the grades obtained by soldiers in each of the theoretical tests were taken in order to allow a final performance grade to be considered, adjusted to the TAS, according to Equation 3.

$$GF_{\alpha} = \frac{PT1 + PT2 + PT3 + PTE}{4} \quad (3)$$

Data were recorded in the BINFA Military Instruction Section, the sector responsible for managing instructions and learning verifications, according to item 3.1.4 of the PAVL (BRASIL, 2013a). Compiling this collection was made possible by a Microsoft Excel spreadsheet.

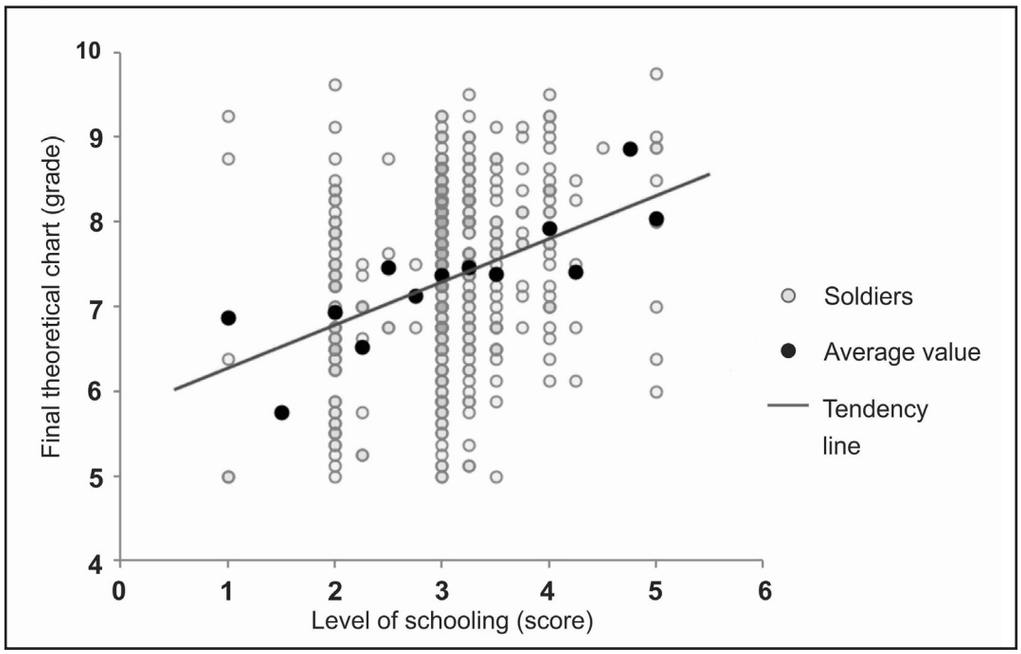
In addition to these data, information collected about the level of education was gathered. Therefore, it is possible to investigate the correspondence between each military's amount of knowledge prior to the course and the performance degree in the cognitive field at the end of the course. The relationship obtained from the database can be verified in Graph 3.

Table 4 - Theoretical and practical subjects evaluated.

Type	Instruction	Assessment
Theoretical	Military Legislation I Military Legislation II Military Justice Legislation	PT1
	Arms, Ammunition and Shooting	PT2
	Ground Combat Tactics I Ground Combat Tactics II Security in Facilities	PT3
	Air Force Police I Air Force Police II Ground Combat Tactics III General concepts of surface self-defense and aeronautical installations	PTE
Practice	Military Physical Training	PP1
	United Order	PP2

Source: The author.

Graph 3 - Theoretical grades obtained in the CFSd versus level of schooling.



Source: The author.

In this Graph, the adjusted final grade (final average of the theoretical tests) and the level of schooling, in terms of the score in Table 2, of the 421 soldiers under study, were compared. Overlaps of points on the Graph were represented by the regions with the highest gray scale density.

In order to provide greater robustness to the mass of data, reducing its sensitivity to grades changes, average scores obtained by level of schooling were calculated. In other words, it was possible to observe a more concrete expected value for schooling level.

As a factor to support the analysis, a tendency line was added to Graph 3, showing how the values sought to behave. Observing the grades average values for each level of schooling, in contrast to the tendency line, behavior with a similar characteristic was verified. Analysis of the statistical adherence quality of the data was studied using the Pearson coefficient (ρ).

Mathematical calculations used presented the estimation of $\rho = 0.8529$. The present result allowed to infer, according to interpretation of the statistical theory (Table 2), that there is a strong positive correlation between the variables schooling level and final grade of adjusted performance. In other words, since the coefficient is conceived from linear adjustment, the higher the schooling the greater the performance degree in the cognitive domain tends to be.

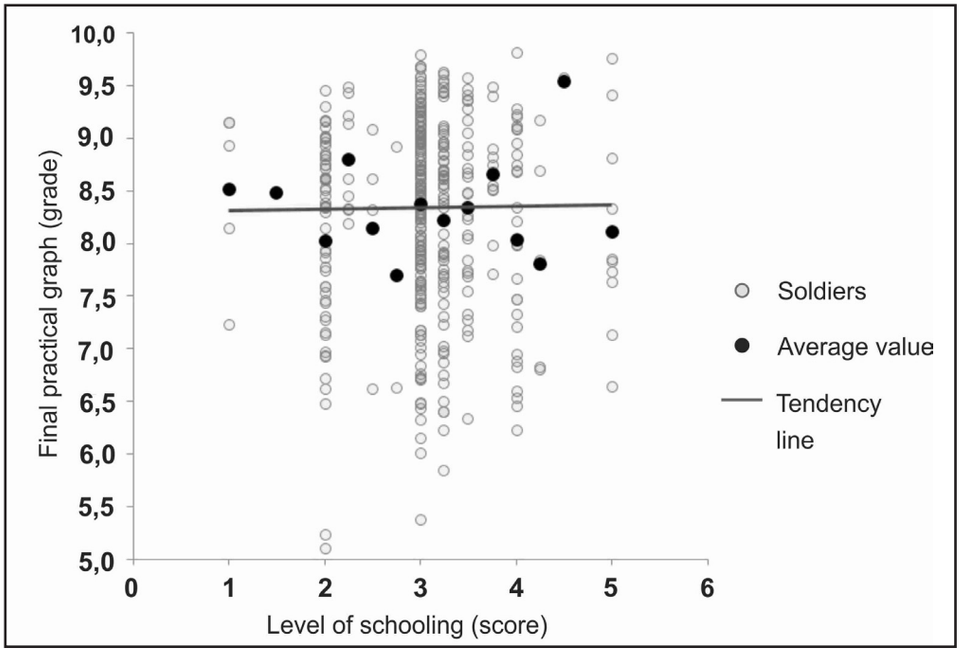
Causality among the variables was supported by the strong statistical association and the TAS. Higher educational level scores represented greater consistency in the military personnel' cognitive structure, derived from the secondary, technical and theoretical courses carried out. This greater consistency indicated the presence of a greater number of subsumptions, responsible for the interconnection and assimilation of new knowledge.

Reinforcing the TAS validation, it was verified in the mass of data if there was an association between the level of schooling and the performance degree (grades) in the course practical evaluations. The study of this relationship was illustrated in Graph 4.

Proceeding to calculating the Pearson coefficient, a $\rho = 0.0442$ value was obtained. According to the interpretation of Table 2, this near-zero index expresses a negligible correlation between schooling and practical tests grades, that is, there was no association between the structures of the cognitive domain and the psychomotor domain. Graphically, it was possible to observe that, in fact, the variation in educational level showed an indifferent/constant tendency of variation of means in practical tests.

Previous experience in the individual's mental structure in the light of TAS, such as the practice of taking tests, the systematic of studies and the associated anchors of previous knowledge (subsumptions), contributed to the soldiers' cognitive performance in the course.

Graph 4 - Practical grades obtained in the CFSd versus level of schooling.



Source: The author.

5 CONCLUSION

This research motivating concern arose in view of the BINFA-64 Soldiers' Training Course good performance relevance for the conscripts' better adaptation to the military activities performance in the several DCTA organizations. Among the several factors that are likely to alter course performance, the present study aimed to investigate the following question: What is the influence of soldiers' level of schooling on their performance in BINFA-64 at the end of the initial training period?

Under the argument of guiding research efforts towards the achievement of their proposal, four specific objectives were established: to identify the conscripts' initial selection process criteria in the Mobilizing Section (SMOB-48), according to the Initial Military Service rules (OE1); to record the schooling level and the courses listed in the Conscripts' Selection File (OE2); to identify the performance assessment requirements included in the CFSd minimum curriculum in the construction of the final grade obtained by the military (OE3) and to verify the overall degree and the grades obtained in the CFSd theoretical and practical tests (OE4).

Verification of the initial selection process criteria (OE1) allowed a macro view of the conscripts' incorporation states for the Initial Military Service. As a consequence, it was possible to locate at what moment and in what way the level of schooling of future military personnel was recorded. Such task ended up being supervised by SMOB-48 and carried out by a Selection Committee since the publication of the Regulatory Instructions of Soldiers Personnel (IRQ) in 2014. Among the committee's various attributions was curriculum analysis of enlisted youth, which promoted the documental validation of the level of schooling recorded.

Gathering such schooling information was performed by filling the Conscripts' Selection File provided for in the IRQ, which suggested the translation of the schooling level and out-of-school courses into scoring. Such numerical scale permitted the stratification of the level of schooling for the data mass of the teams under study. Scoring recording were made effective by means of accessing the Mobilizing Section (OE2) database and showed that the soldiers had complete elementary school degree (3%), incomplete secondary school degree (17%), complete secondary school degree (66%), technical secondary school degree (10%) and incomplete higher education degree (4%).

Continuing with the construction of the research problem variables, the assessment criteria in determining the overall performance final grade at the end of the course (OE3) were verified in the CFSd minimum curriculum. The investigation supported the identification of the disciplines evaluated and the

weighting of the theoretical and practical tests in the final grade, the first one representing 67% of this grade and the second one, 37%. With this, it was possible to study the cognitive and psychomotor domains assessments results for each schooling level.

Monitoring and management of the learning checks by the Military Instruction Section allowed the recording of military performance degrees in the training course (OE4). Investigation of each military's tests grades made it possible to unlink the results obtained in the theoretical and practical evaluations. Thus, the basis for analysis of the contribution of the portions of the cognitive and psychomotor fields in the composition of the overall final grade was established.

Under the focus of the Theory of Meaningful Learning (TAS), the score alluding to soldiers' level of schooling could be quantified as the military personnel' cognitive structure degree of development. This development indicated the presence of a greater number of subsumptions responsible for the interconnection and formation of new knowledge. This foundation of TAS was analyzed by the statistical correlation of the soldiers' schooling levels with their final performance grade in the course. The correlation analysis branched out in the cognitive and psychomotor fields by virtue of, respectively, the theoretical and practical evaluations that made up the final grade. By calculating and interpreting the Pearson coefficient, it was possible to see a strong correlation index ($\rho = 0.85$) between the schooling level and the theoretical assessment grades, and a negligible correlation index ($\rho = 0.04$) between the schooling level and the practical assessments grades (MONTGOMERY, 2009). To the detriment of the portion of cognitive evaluation representing approximately 70% of the course grades, a strong association between schooling and the overall performance level was identified in the CFSd. The result mentioned, proved by the coefficient, finalized the research problem answer, indicating that there is a positive influence of the soldiers' schooling level in the performance degree obtained by the BINFA-64 2015 and 2016 teams at the end of the course.

The aspects discussed in the research serve as a basis for verifying the implications of the new Initial Military Service selection structure proposed by the Regulatory Instructions in 2014. The efforts by the Committee designated to conscripts' curriculum analysis in SMOB-48 have influenced in course performance, reinforcing the new Strategic Plan (BRASIL, 2016) view of improving the recruitment process by focusing on training and raising knowledge.

The present study does not intend to exhaust the analysis of aspects that influence soldiers' performance in the CFSd nor to substantiate the efficiency of the current military selection process. Discussion of the research, guided by military service regulations, aims to encourage the expansion of studies to other units of soldiers' incorporation with the intention of instigating future work in raising these soldiers' training.

REFERENCES

AUSUBEL, D. P. **Aquisição e retenção de conhecimentos**: uma perspectiva cognitiva. Lisboa: Paralelo, 2003.

BRASIL. Comando da Aeronáutica. Departamento de Ensino. Portaria DEPENS nº182/DE-1, de 07 de maio de 2013. Aprova a reedição do Currículo Mínimo do Curso de Formação de Soldados (ICA 33-73). **Boletim do Comando da Aeronáutica**. Brasília, DF, n.89, 10 maio 2013.

_____. Comando da Aeronáutica. Departamento de Ensino. Portaria DEPENS nº292/DE-1, de 23 de julho de 2013. Aprova a edição do Plano de Avaliação do Curso de Formação de Soldados (ICA 37-572). **Boletim do Comando da Aeronáutica**. Brasília, DF, n.142, 26 jul. 2013a.

_____. Comando da Aeronáutica. Diretoria de Administração de Pessoal. Portaria DIRAP nº701/DSM, de 10 de março de 2003. Aprova o Recrutamento de Conscritos para o Serviço Militar Inicial (ICA 33-16). **Boletim do Comando da Aeronáutica**, Rio de Janeiro, n.48, 13 mar. 2003.

_____. Comando da Aeronáutica. Diretoria de Administração de Pessoal. Portaria DIRAP nº2024-T/SAPSM, de 22 de março de 2016. Aprova a reedição das Instruções Complementares de Convocação para o Serviço Militar Inicial (ICA 33-2). **Boletim do Comando da Aeronáutica**, Rio de Janeiro, n.51, 24 mar. 2016.

_____. Comando da Aeronáutica. Gabinete do Comandante da Aeronáutica. Portaria nº1048/GC3, de 25 de agosto de 2014. Aprova a reedição da Instrução Reguladora do Quadro de Soldados (ICA 39-22). **Boletim do Comando da Aeronáutica**, Brasília, DF, n.175, 16 set. 2014.

_____. Comando da Aeronáutica. Gabinete do Comandante da Aeronáutica. Portaria nº189/GC3, de 30 de janeiro de 2016. Aprova a edição da Concepção Estratégica "Força Aérea 100" (DCA 11-45). **Boletim do Comando da Aeronáutica**, Brasília, DF, n.18, 01 fev 2016.

CHIAVENATO, I. Seleção de Pessoal. In: _____. **Recursos humanos**. 8. ed. São Paulo: Atlas, 2003. Cap. 6, p. 185.

FRANCISCO FILHO, L. L. Análise da Relação da Criminalidade e Baixo Nível Escolar. **Revista Intellectus**, Jaguariúna, ano VIII, n.22, p.175-190, out. 2012.

GIL, A. C. **Como elaborar projetos de pesquisa**. 4. ed. São Paulo: Atlas, 2002.

MONTGOMERY, D. C.; RUNGER, G. C. **Estatística aplicada e probabilidade para Engenheiros**. 4. ed. Rio de Janeiro: Ltc, 2009. 512 p.

RODRIGUES, J. F.; GIRAFFA, L. M. M. ; RISSOLI, V. R. V. **Teoria da aprendizagem significativa**. 2010. Universidade Católica de Brasília. Disponível em: <https://cae.ucb.br/tas/tas/tas01.html>. Acesso em: 16 abr. 2017.

RONCA, A. C. C. Teorias de ensino: a contribuição de David Ausubel. **Temas de Psicologia**, Ribeirão Preto, v. 2, n. 3, 1994. Disponível em: <http://pepsic.bvsalud.org/scielo.php>. Acesso em: 14 mar. 2017.

VALÉRIO, M. **Teoria de Ausubel**. Departamento de Psicologia, Disciplina: Aprendizagem e Ensino, Universidade de Brasília, DF, 1999. Disponível em: <http://www.xr.pro.br/Monografias/AUSUBEL Acesso em: 09 mar. 2017.