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Evaluating the Content of Palestinian Curricula in Light of the Sustainable Development Goals 2030

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Background: Curriculum evaluation is a dynamic and indispensable process necessary to develop the curriculum, and to support decision-makers with evidences to guide the curriculum towards the intended goals. The Sustainable Development Goals (SDGs) are the most important universal goals to be taken into consideration by curriculum. SDGs represent a call to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. Because education, through curriculum, is the nations' key to accelerate the achievement of sustainable development, this study evaluates the content of the Palestinian curriculum and assesses the degree to which SDGs are included in the curriculum.

Purpose: The study aimed to evaluate the Palestinian school curricula, through using national standards for each SDG, to examine the degree to which the SDGs are incorporated in the curricula, and to know whether there is variation in this incorporation among the different curricular subjects.

Setting: The study evaluates the content of Palestinian curricula of the main subjects based on national curriculum standards developed and published in light of the SDGs. These subjects are: Arabic Language for grades 1-12, Science for grades 1-12, Mathematics for grades 1-12, Social Studies for grades 1-12, Technology for grades 5-12, Agricultural Sciences for grades 11-12, Renewable Energy for grades 11-12, Entrepreneurship and Business for grades 11-12, Management and Economy for grades 11-12, and Smart Buildings for grades 11-12. In addition, timeframe delimit is the academic year 2018-2019.

Data Collection and Analysis: In order to evaluate content of the Palestinian curricula, descriptive-analytical methodology was used by utilizing content analysis of the guideline document for each curricular subject.

Findings: The results showed variation in the inclusion of the SDGs, and absence of essential aspects. The fourth SDG (Quality Education) obtained the highest inclusion percentage with 28.5%. While the fourteenth SDG (Life below Water) obtained the lowest inclusion percentage with 0.8%. In light of the results, the study highlighted variation of the curriculum from SDGs and recommended for the development and enrichment of the Palestinian curriculum to ensure the inclusion of SDGs, with its all dimensions, considering that education in Palestine defined as the main gateway towards progressing achievement of the SDGs.

Keywords: *the 2030 agenda for sustainable development; content analysis; evaluation; SDGs; standards*

Background

Educational evaluation is one of the necessary processes to ensure the continued success of the educational process and the improvement of its practices. The curriculum evaluation is one of the dynamic processes necessary to develop the curriculum. Since the curricula are one of the most important tools for change in society, they are an honest image that reflects its situation, culture, needs, and future aspirations. Therefore, the trends of the contemporary world considered it a means of developing the human forces necessary to achieve comprehensive development to overcome the challenges of urbanity (Nour Al-Dein, 2017). The relationship between education and development is a correlative relationship, and the higher the quality of education, the better the human capital (Marzooq, 2017).

Reorienting curricula approaches to integrate the concept of sustainable development has become an international requirement, bearing in mind that the human being has become the focus of the definitions that addressed the concept of sustainable development (UNESCO, 2012). During the Summit on Sustainable Development held in 2015 at the United Nations Headquarters in New York, 193 Member States adopted a new global program (framework) for sustainable development entitled 'Transforming our world: The 2030 Agenda for Sustainable Development'. This program included 17 goals called, Sustainable Development Goals (SDG) covering the dimensions of sustainable development represented by economic growth, social inclusion, environmental protection, justice, peace and good governance (UN General Assembly, 2015, a, b).

The United Nations General Assembly approved a project of the decade, the Education for Sustainable Development Project, to emphasize the role of education in helping people build a future vision, face life-threatening problems, and achieve environmental balance for future generations. This has forced countries to introduce education for sustainable development within their educational reform (Arleta, 2019). In this context, the International Federation of Entrepreneurial Institutes in Denmark made recommendations in 2009 emphasizing that there is no sustainable development without education; that education for sustainable development is a requirement and a need for all societies; and, that the curricula implemented in schools play a crucial role in achieving sustainable development (International Alliance of Leading Education Institutes, 2009). This is consistent with what Vladimirova and Blanc (2016) stated, linking education with the 17 SDGs, and provided a structured detail that forms the basis for an integrated analysis of educational policy priorities for the education sector as a whole.

In 2014, The global conference held in Japan concluded with issuing the 'Aichi-Nagoya Declaration', in which it called on countries to take urgent measures to mainstream education for sustainable development, and to enhance its inclusion in the post-year development plan (UNESCO, 2015, a).

With the emergence of the SDGs 2030 and the role of education through school curricula to achieve those goals, it became necessary to evaluate the curricula in order to know the extent of inclusion of those development goals, and work on developing the curricula in a manner that utilizes them as a tool to accelerate progress towards all goals.

Literature Review

1. Curriculum Evaluation

Based on the fact that curriculum evaluation is one of the dynamic processes needed to develop the curriculum (Aslan & Saglam, 2017), it is the process that determines the effectiveness of the curriculum, and whether the curricula need to be modified, changed, reformed, or composed, which is known as curriculum development (Ozudogru, 2018).

There are many definitions for evaluating the curriculum, including:

> A comprehensive definition for curriculum evaluation is a decision-making process about validity, efficiency, effectiveness, appropriateness, usefulness, success and excitability of a developed curriculum by using significant research process (Aslan & Saglam, 2017).

Evaluating the curriculum has several purposes, the most prominent of which is to determine the extent of students' learning outcomes and their acquisition of knowledge, skills and attitudes, and to benefit from what they have studied in employing them to face life situations. The curriculum evaluation also determines the goals that the curriculum implementer has reached, and to ensure the appropriateness of the different curriculum elements for students' age stages and their needs. This is in addition to providing decision makers with information and data that help in good planning, and to identify the deficiencies in the curricula in order to take the appropriate decisions accordingly (Mehrens & Lehmann, 1984).

It is also necessary for curriculum evaluation processes to be carried out with effective means and tools. A good planning process must be in order. To achieve this, the evaluation must be based on rules, standards and foundations. Standards are needed to achieve quality in education. They need to be based on the belief that an organized method of reform is necessary to achieve meaningful change (Fenwick, 2017).

Content analysis is considered a tool for scientific research used as an objective, structured and quantitative description of the apparent content of the material to be analyzed. Thus, a tool for answering evaluation questions (Teama, 2004). It provides the authors and designers of the curricula with evidence of what should be included in the content and what should be avoided (Mohammad & Abed Al-Atheem, 2012).

According to Posner (2004), any ideal curriculum analyzed should highlight 6 kinds of information, which are not included all in a single curriculum document, namely: 1) The problem to which the curriculum was responding, and the experts who included in the development process; 2) clear idea of what students are proposed to learn from the curriculum such as learning objectives, content and its sequence; 3) clear idea for choosing learning objectives; 4) teaching strategies; 5) evaluation methods and their results; and, 6) the reality of curriculum implementation, conditions for its implementation, and an explanation of constraints in the event the curriculum is not being implemented.

2. Sustainable Development Goals

In 2015, 193 member states of the United Nations adopted a new agenda for global development at an international summit entitled 'Transforming our world: the sustainable development plan for the year 2030.' Those countries renewed their determination to complete the efforts made over 15 years within the framework of the Millennium Development Goals. This plan represents a work program for all Poor, rich, and middle-income countries to work and prosper, taking into account the protection of the planet.

According to the development agenda, the Sustainable Development Goals included in the plan are more comprehensive and broader than the Millennium Development Goals, as they apply to all developed and developing countries, while the Millennium Development Goals only targeted developing countries, the poorest, in particular. The plan also includes 17 goals, 169 objectives, and 230 indicators, covering the three dimensions of sustainable economic, social and environmental development, along with other dimensions related to justice, peace and good governance. This is compared with the Millennium Goals, which were limited to societal development within 8 developmental goals, 21 objectives, and 60 indicators. There is another difference related to how to achieve those goals, since the SDGs were developed with the participation of the governments of the countries and stakeholders, while the Millennium Development Goals (MDGs) were developed by United Nations experts (UN General Assembly, 2015, a, b). Table 1 includes the SDGs.

Table 1
Sustainable Development Goals 2030

Number	Goal
SDG1	End poverty in all its forms everywhere.
SDG2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
SDG3	Ensure healthy lives and promote well-being for all at all ages.
SDG4	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
SDG5	Achieve gender equality and empower all women and girls.
SDG6	Ensure availability and sustainable management of water and sanitation for all.
SDG7	Ensure access to affordable, reliable, sustainable and modern energy for all.
SDG8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
SDG8	Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
SDG10	Reduce income inequality within and among countries.
SDG11	Make cities and human settlements inclusive, safe, resilient, and sustainable.
SDG12	Ensure sustainable consumption and production patterns.
SDG13	Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
SDG14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
SDG15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
SDG16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
SDG17	Strengthen the means of implementation and revitalize the global partnership for sustainable development.

3. Education and Sustainable Development

Concerning education within the sustainable development plan, there are two tracks: The first deals with the SDG4 as an independent goal in itself; stressing the importance of providing equitable and quality education and lifelong learning. The second track deals with education as an essential factor in achieving sustainable development, as access to equitable education and lifelong learning enables societies to develop the skills and innovations necessary to overcome political, economic, health, technological and environmental challenges to ensure that they stay on the path of sustainable development. Accordingly, each of the 17 goals included a set of objectives, including at least one objective dealing with education, training, or learning (UNESCO, 2015, a).

In order for education to be a tool to accelerate progress towards the rest of the goals, it is necessary to work on several aspects, the most prominent of which is

curricula as tools to establish the political and social rules of societies. They are considered as an essential component of the educational system, and an effective way to achieve its goals, the most influential and influenced by the changes of times. Since society develops and changes according to environmental and cultural changes, the curricula must simulate this change because they reflect the state of society, its culture, needs and future aspirations (Saada & Ibrahim, 2008).

The curricula should lead to scientific, cultural, social and economic changes taking place at the local, regional and global levels. They need to incorporate within them contemporary issues such as human rights, international humanitarian law, conflict resolution, gender, environmental protection and sustainable development. Thus, developing general education curricula (natural and humanities) can ensure the provision of trained labour and expert minds in solving the problems of the world, as well as creative and productive individuals that contribute to solving all problems, which, consequently, lead to achieving the goals of sustainable development in its various dimensions (Center for Educational Research and Development, 2018).

Several studies examined the link between education and the SDGs. Lim et al. (2018) have provided a prioritization framework to enhance effective implementation of the SDGs. Success of the SDGs needs to assess the extent of their contribution to human development while enhancing the protection of the planet to save the rights of current and future generations. In addition, the study concluded that supporting creativity and capacity development throughout education is an essential progressive determinant towards the achievement of the SDGs. In addition, Akinsooto and Akpomuje (2018) has examined how people acquire knowledge and skills linked to economic activities in relation to the SDG1 (poverty alleviation), they underlined that informal learning becomes an important livelihood mean and, thereby, an approach for eradicating poverty in Nigeria. The study recommended the necessity of providing great opportunities for adult and lifelong education. On the other hand, the study of Geryk (2018) has outlined the role of education, universities and tertiary education institutions in achieving the SDGs. The study highlighted that building human capital and developing capabilities is the core component for sustainable development and for facing challenges ahead of the nations. The study see that such institutions should set new goals like serving communities, uncover ground breaking research, developing excellence in teaching and sustainable teaching. The study recommends that universities should play an effective role and build up new road map to strengthen ties between universities on the one hand and their societies on the other hand to meet society needs in line with the United Nations Agenda 2030. In addition, Dlouha and Pospisilova (2017) study has examined recent discussions on the notions of 'education for sustainable development' and 'competency-based education'. It linked the notions to the policy processes implemented in the Czech Republic towards the SDGs, specifically goal (4.7: knowledge and skills in promotion to sustainable development). This is to nationalize the 2030 agenda and interlink it at the national level in the Republic. A new educational vision was agreed based on four domains: self-confident, grounded, engaged and open. Driven by the above vision, educational goals to be generated and then the curriculum is developed to achieve the goals. In extension of that, the study of Diab and Molinari (2017) presents a practical approach for advancing education. The approach positioned education as the core and heart part of a strategy set in 2015 to achieve the SDGs. On 200 students from graduate schools in London and Moscow, the study adopted a 'case study' approach to develop education using the interdisciplinary approach. The study demonstrated the significance of adopting an interdisciplinary approach about 'education for sustainable development'. General skills and knowledge to be develop with the participation of officials in various sectors such as health, environment, poverty and human rights. The study emphasized that if sustainable development is not included in specific courses, it will not be sufficient to prepare individuals who are able to make decisions in their daily lives to deal with the challenges of sustainability. In addition, the study of Shahda (2017) aimed to develop new

insights and ideas for the role of curriculum in achieving sustainable development. The study dealt with the science curriculum with its different components: objectives, content, teaching methods, evaluation, and the teacher's role in this. In addition, the study presents three mechanisms to incorporate sustainable development and its goals and concepts in the curricular content. Namely: 1) independent entry: a special curriculum for sustainable development to be prepared, 2) integrative approach: means that sustainable development concepts could be incorporate into topics related to environment and environmental resources and 3) entrance three: associated with the development of independent units that address the concept of sustainable development and the requirements for achieving it. In addition, the study of Fegbesan et al. (2017) is an evaluation study presents a content analysis of the social studies curriculum in relation to incorporating SDGs and concepts. In detail, the study aimed at determining the degree to which the content of social studies in Nigeria includes the concepts of sustainability according to its three dimensions: socio-cultural dimension, environmental dimension, and economic dimension. The study provides a representation of the three dimensions in varying proportions. The study recommends the need to focus on training teachers on the five essential pedagogical principles of sustainability namely: critical thinking, creative thinking, participation and participatory learning, systematic thinking, and partnerships. The report of Pota (2017) demonstrates the truth that education is the solid base for sustainable development, and that the world will not reach its goals if education level remains low. The report included many examples from different countries about the role of education in the rise of different sectors. The report recommends the need for urgent serious commitment from governments towards achieving the SDGs, and re-confirms the already known statement 'obtaining the right education provides halfway towards solving the world's problems'. The study of Vladimirova and Blanc (2016) aimed to examine, through exhaustive content analysis of 37 UN global reports, how well links between education and the SDGs represented in the UN publications system. The study linked each of the 17 SDGs to education, excluding the SDG14 (oceans). The study came up with the fact that there are important causal links between education and the rest of the SDGs. The study recommends that all UN reports on its development programs should be clearly and adequately reflect the link between education and the SDGs. Furthermore, the systematic analysis used in this study offers the base for an integrated analysis of policy priorities for education as a whole. Another study by Mochizuki (2016) examined and described international procedures related to the concept of 'Education for Sustainable Development-ESD', which is linked to the SDG4 (in specific Global Citizenship Education-GCED). The study recommends approaches to ensure that education contributes to a more sustainable world. It also recommends the re-orientation of international education systems towards peace and sustainable development rather than the superficial incorporation of education and citizenship concepts into curricula that already burdened with these concepts.

4. Palestinian Curriculum

The Ministry of Education in Palestine began in 2015 the development of school curriculum based on results driven from several evaluation studies and for the following justifications (Ministry of Education and Higher Education, 2016):

- Accelerated development of knowledge and technology, which required a re-directing process of future generations.
- Development of contemporary trends in learning and teaching policies, and development on the roles of teacher qualification.
- Existing curriculum might be outdated as it was written 15 years ago.
- Results of national and international tests that indicated a decline in student achievement levels.
- Field studies that indicated weakness in presenting life skills in the curriculum,

- Poor linkage between the curriculum concepts and life context and thinking patterns.
- Opinion of different society groups and specialists on the necessity of reforming education through several aspects, most notably the development of curricula.

Formally, in 2016 the Ministry issued the reference framework document for developing the national curriculum. In 2017, the Ministry issued the guidelines documents for each curricular subjects in Palestine.

A guideline document defined as a detailed document pertaining to each curricular subject. It forms the basis upon which the textbooks are designed and written. In addition, it contains the details of general and specific outcomes (learning objectives), intends of assessment and evaluation, and the scope and sequence matrix for each grade, and the matrix of the subject elements including teaching and evaluation strategies, and content standards.

Problem and Study Questions

Official reports issued by the United Nations confirmed that it is the responsibility of the signatory governments of the 2030 Agenda for Sustainable Development to develop national frameworks towards achieving the seventeen SDGs. The signatory governments' responsibilities should consequently include the development of national policies, plans and programs. Education is considered one of the main approaches to develop such national frameworks, including educational curricula in particular, with its various components such as learning objectives, content, activities and evaluation (UNESCO, 2016). The absence of such planning at the national level may create a gap between what states have committed to and what included in their curricula. It may also contribute to creating a negative gap in the assumed role of education, through curricula, in achieving the SDGs. This argues that there is a need to evaluate the education curriculum to examine the extent to which the SDGs are incorporated in the curricula. Such indispensable evaluation will provide clear and specific evidences on the curricular strengths and weaknesses in approaching the SDGs 2030. Thus, the evaluation will serve the process of developing and enriching the Palestinian curricula according to educational and scientific foundations.

The study addressed two questions:

1. To what extent do the SDGs are incorporated in the Palestinian curricula?
2. Does the extent of such incorporation differs according to the curricular subject?

Purpose of the Study

The study aimed to evaluate the Palestinian school curricula, through using national standards for each SDG, to examine the degree to which the SDGs are incorporated in the curricula, and to know whether there is variation in this incorporation among the different curricular subjects.

Importance of the Study

Importance of the study lies in the fact that it provides, based on national curriculum standards developed for each SDG, an assessment that judges quality of the Palestinian curricula by knowing the degree to which the curricular documents include the SDGs. Thus, the study provides evidence on the reality of the practical translation of educational policies included in the General National Curriculum Framework on the one hand, and guidelines document of each curricular subject on the other hand. Consequently, the study is useful in drawing the attention of educational leaders in Palestine and those interested in the world to the reality of including the SDGs in the Palestinian curricula. In turn, this will allow identification of strengths and so re-enforcement of Palestinian curricula. It will also detect potential curricular weaknesses and address them for improvement in the coming years. Furthermore, the study promotes horizons for international researchers and interested persons to conduct similar studies consistent with the needs of their countries.

Delimitations and Limitations of the Study

The subject of the study is limited to the analyzing the content and documents of the main curricular subjects, based on national curriculum standards developed and published in light of the SDGs (Elyan & Doulat, 2020). These subjects are: Arabic Language for grades (1-12), Science for grades (1-12), Mathematics for grades (1-12), Social Studies for grades (1-12), Technology for grades (5-12), Agricultural Sciences for grades (11- 12), Renewable Energy for grades (11-12), Entrepreneurship and Business for grades (11-12), Management and Economy for grades (11-12), and Smart Buildings for grades -11) (12. In addition, timeframe delimit is the academic year 2018-2019.

Methodology

This study evaluates the content of Palestinian curricula and assesses the degree to which SDGs are included in the curriculum. In order to achieve aim of the study, methodology for content analysis of the guideline document for each curricular subject was used. Based on that, the study was undertaken with the following steps:

Step1: Using National Curricular Standards Responsive to SDGs

Because content analysis has to rely on agreed bases, which are the standards, step 1 denotes the solid base and rational to implement a subjective evaluation. For that, the study used standards that were developed in light of SDGs, and published (Elyan & Doulat, 2020) and (Elyan & Doulat, 2021).

The national curricular standards responsive to SDGs are 63 standards covering the 17 SDGs, and include conditional terms that describe the detailed topics for each SDG that must be included in the curriculum. Table 2 shows the 63 standards per each SDG.

Table 2
National Curricular Standards Responsive to SDGs Used in the Study

Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	Goal 9
1. Poverty in Palestine: concept and causes.	4. Hunger and its causes.	8. Patterns of healthy life.	12. High quality education curriculum for pre-school to grade 12 phase, and for Non-formal education.	16. Human rights principles.	20. Water health, safety and availability.	25. Sources of energy.	28. Development of economy in Palestine.	33. Sustainable infrastructure.
2. Impact of poverty on various aspects of Palestinian life.	5. Malnutrition.	9. Public and community health.	13. Curriculum that enhances the 21st century competencies (lifelong learning skills).	17. Gender-related roles and centers in the Palestinian society.	21. Sanitation services.	26. Renewable clean energy technology.	29. Work and production, and their role in improving individual's productivity and living standards.	34. Holistic and sustainable manufacturing.
	6. Plant and animal production.	10. Reproduction and sexual health.	14. Teachers capable of providing the intended education.	18. Levels of inequality between genders.	22. Diseases associated with water pollution, and consequent results.		30. Decent work.	35. National industrial product.
3. Poverty-reduction mechanisms in Palestine.	7. Mechanisms for hunger reduction in Palestine.	11. Social determinants of health.	15. Educational facilities and equipment that cater for learners' needs.	19. Balance towards gender speech.	23. Integrated management of water resources, and its protection from pollution.	27. Mechanisms for rationalizing energy consumption in Palestine.	31. Entrepreneurial learning.	
					24. Water rights in Palestine.		32. Vocational education.	

Goal 10	Goal 11	Goal 12	Goal 13	Goal 14	Goal 15	Goal 16	Goal 17
36. Cultural pluralism.	39. Affordable housing.	44. Sustainable production and consumption.	47. Climate change concept.	50. Marine environment.	53. Ecosystems and biodiversity.	58. Principles of democracy and human rights.	60. Palestine: a state with limited financial resources.
37. Local and international processes that promote or obstruct equality.	40. Sustainable planning and construction.	45. Available natural resources in Palestine.	48. Adaptation to climate change.	51. Threats to marine resources.	54. Forestry.	59. Characteristics of a good society.	61. Participation is a right.
	41. Sustainable (green) public transportation.			52. Sustainable management of marine resources.	55. Desertification and land deterioration.		
	42. Cultural heritage.				56. Food security.		62. Relationship of Palestinian human with the world.
					57. Sustainable management of ecosystems, biodiversity, forestry and lands.		
38. Wealth distribution (national income).	43. Safety from natural and human-made disasters.	46. Different waste management methods.	49. Reduction of climate change.				63. Technology and Partnership.

Step 2: Determination of the Study Population

Population of analysis represented by the guideline document for each curricular subject stated by the Palestinian Curriculum Center. They are 10 documents covering the following subjects: Arabic Language, Science, Mathematics, Social Studies, Technology, Agricultural Sciences, Renewable Energy, Entrepreneurship and Business, and Management and Economy.

Five of the documents were complete in terms of their parts (learning objective, principles, scope and sequence, matrix of curricular elements, standards of content, and assessment and evaluation). Namely, these documents are Arabic Language, Science, Mathematics, Social Studies, and Technology.

The other five documents were incomplete in terms of their parts. Namely, these documents are Agricultural Sciences, Renewable Energy, Entrepreneurship and Business, and Management and Economy.

Step 3: Determination of the Analysis Categories

The categories represented by the 63 national curricular standards responsive to the SDGs, listed in Table 1.

Step 4: Determination of the Analysis Units

The analysis unit is 'sentence' and 'paragraph', which were subject to frequency and counting.

Step 5: Design of the Study Instrument

The instrument is the 'analysis framework', designed in light of the national curricular standards responsive to SDGs, which are the 63 standards listed in Table 1. The degree of incorporation was described by calculating the frequencies and percentage per each standard and per each SDG.

Step 6: Validity of the Instrument

The instrument was validated by a panel of experts specialized in curriculum and teaching, and to experts in curriculum design at the Ministry of Education.

Step 7: Reliability of the Analysis

Reliability of the analysis was confirmed through two ways:

1. Inter nater reliability: the researchers analyzed 50 pages of the science subject document in light of the aforementioned analysis framework (step 5). Then, an expert was asked to analyse the same pages according to the same framework. Then, the reliability coefficient (agreement coefficient) between the two analyses was calculated using the Copper Formula (number of categories agreed by the researchers, in the 2 analysis, divided by the total number of agreed and non-agreed categories). The reliability coefficient was (82.5).
2. Intra nater reliability: the researchers repeated the same analysis after two weeks. The reliability coefficient was calculated at (85.0).

Based on steps 6 and 7, instrument of the analysis (framework) was made ready in hand. Accordingly, the researchers analyzed the 10 documents completely. In other word, the analysis targeted the whole population, and so, was not sample-based analysis.

Step 8: Statistical Analysis

Calculation of frequencies and percentages was performed for the following:

1. National curricular standards responsive to the SDGs.
2. The 17 SDGs.

Results and Discussion

The frequencies and percentages obtained for each of the national curricular standards responsive to the SDGs were calculated as shown in Table 3.

Table 3
Frequencies and Percentages of the National Curricular Standards Responsive to the SDGs

SDG	National curricular standards responsive to the SDGs 2030	Frequency	Percentage
SDG1	1. Poverty in Palestine: concept and causes.	6	0.1%
	2. Impact of poverty on various aspects of Palestinian life.	16	0.3%
	3. Poverty-reduction mechanisms in Palestine.	45	0.9%
	Total for SDG1	67	1.3%
SDG2	4. Hunger and its causes.	14	0.3%
	5. Malnutrition.	89	1.7%
	6. Plant and animal production.	101	1.9%
	7. Mechanisms for hunger reduction in Palestine.	237	4.5%
	Total for SDG2	441	8.4%
SDG3	8. Patterns of healthy life.	93	1.8%
	9. Public and community health.	114	2.2%
	10. Reproduction and sexual health.	30	0.6%
	11. Social determinants of health.	17	0.3%
	Total for SDG3	254	4.8%
SDG4	12. High quality education curriculum for pre-school to grade 12 phase, and for Non-formal education.	623	11.8%
	13. Curriculum that enhances the 21st century competencies (lifelong learning skills).	788	15.0%
	14. Teachers capable of providing the intended education.	60	1.1%
	15. Educational facilities and equipment that cater for learners' needs.	26	0.5%
	Total for SDG4	1497	28.5%
SDG5	16. Human rights principles.	41	0.8%
	17. Gender-related roles and centers in the Palestinian society.	29	0.6%
	18. Levels of inequality between genders.	4	0.1%
	19. Balance towards gender speech.	348	6.6%
	Total for SDG5	422	8.0%
SDG6	20. Water health, safety and availability	42	0.8%
	21. Sanitation services.	18	0.3%
	22. Diseases associated with water pollution, and consequent results.	15	0.3%

SDG	National curricular standards responsive to the SDGs 2030	Frequency	Percentage
	23. Integrated management of water resources, and its protection from pollution.	34	0.6%
	24. Water rights in Palestine.	38	0.7%
	Total for SDG6	147	2.8%
SDG7	25. Sources of energy.	60	1.1%
	26. Renewable clean energy technology.	64	1.2%
	27. Mechanisms for rationalizing energy consumption in Palestine.	32	0.6%
	Total for SDG7	156	3.0%
SDG8	28. Development of economy in Palestine.	127	2.4%
	29. Work and production, and their role in improving individual's productivity and living standards.	48	0.9%
	30. Decent work.	19	0.4%
	31. Entrepreneurial learning.	99	1.9%
	32. Vocational education.	49	0.9%
	Total for SDG8	342	6.5%
SDG9	33. Sustainable infrastructure.	27	0.5%
	34. Holistic and sustainable manufacturing	55	1.0%
	35. National industrial product.	62	1.2%
	Total for SDG9	144	2.7%
SDG10	36. Cultural pluralism.	145	2.8%
	37. Local and international processes that promote or obstruct equality	14	0.3%
	38. Wealth distribution (national income).	19	0.4%
	Total for SDG10	178	3.4%
SDG11	39. Affordable housing.	12	0.2%
	40. Sustainable planning and construction.	53	1.0%
	41. Sustainable (green) public transportation.	12	0.2%
	42. Cultural heritage.	297	5.6%
	43. Safety from natural and human-made disasters.	167	3.2%
	Total for SDG11	541	10.3%
SDG12	44. Sustainable production and consumption.	19	0.4%
	45. Available natural resources in Palestine.	53	1.0%
	46. Different waste management methods.	15	0.3%
	Total for SDG12	87	1.7%
SDG13	47. Climate change concept.	122	2.3%

SDG	National curricular standards responsive to the SDGs 2030	Frequency	Percentage
	48. Adaptation to climate change	7	0.1%
	49. Reduction of climate change.	23	0.4%
	Total for SDG13	152	2.9%
SDG14	50. Marine environment.	18	0.3%
	51. Threats to marine resources.	20	0.4%
	52. Sustainable management of marine resources.	6	0.1%
	Total for SDG14	44	0.8%
SDG15	53. Ecosystems and biodiversity.	82	1.6%
	54. Forestry.	7	0.1%
	55. Desertification and land deterioration.	87	1.7%
	56. Food security.	27	0.5%
	57. Sustainable management of ecosystems, biodiversity, forestry and lands	106	2.0%
	Total for SDG15	309	5.9%
SDG16	58. Principles of democracy and human rights.	255	4.8%
	59. Characteristics of a good society.	118	2.2%
	Total for SDG16	373	7.1%
SDG17	60. Palestine: a state with limited financial resources.	19	0.4%
	61. Participation is a right.	34	0.6%
	62. Relationship of Palestinian human with the world.	25	0.5%
	63. Technology and Partnership	26	0.5%
	Total for SDG17	104	2.0%
	Total for all SDGs	5258	%100

Discussion of Results: Inclusion of National Curricular Standards Responsive to SDGs

The results showed that all the national curricular standards responsive to SDGs 2030 are included in the guideline documents. This result in itself indicates a positive aspect of the Palestinian curriculum. In addition, the results showed that the standards inclusion was with variant percentages. The variation is natural and logic and so frequencies and percentages of the standards cannot be equal, because the variation is attributed to the curriculum priorities set by the Ministry of Education.

Table 2 and Figure 1 illustrate that the national curricular standards, which cover the SDGs, were unevenly included in guidelines documents. Standard number (13: enhancing the approach to possessing 21st Century

competencies), relevant to SDG4[1], had the highest frequency with 788 repetitions, denote 15% of all standards' total repetitions. Standard number (12: high quality education curriculum for pre-school to grade 12, and for Non-formal education), relevant to SDG4, had the second frequency rank with 623 repetitions, denote 11.8% of the total. This noticeable result of these two standards is attributable to two reasons: firstly, having them incorporated within the General Framework for Curricula, which is considered one of the most important references (mother document) for preparing the guideline documents of the various curricular subjects. Secondly, the nature of the two standards is related to quality, which is a top priority for the Palestinian education system (Ministry of Education and Higher Education, 2017). This presents and evidence that curriculum is a major tool to achieve vision and goals of the education system, which is consistent with Nour Aldine (2017), Marzooq (2017), UNESCO (2015b), UNESCO (2016), IBE UNESCO (2015), IBE UNESCO (2016), Vergas (2014), Hamdan (2000), and Hassan (2004).

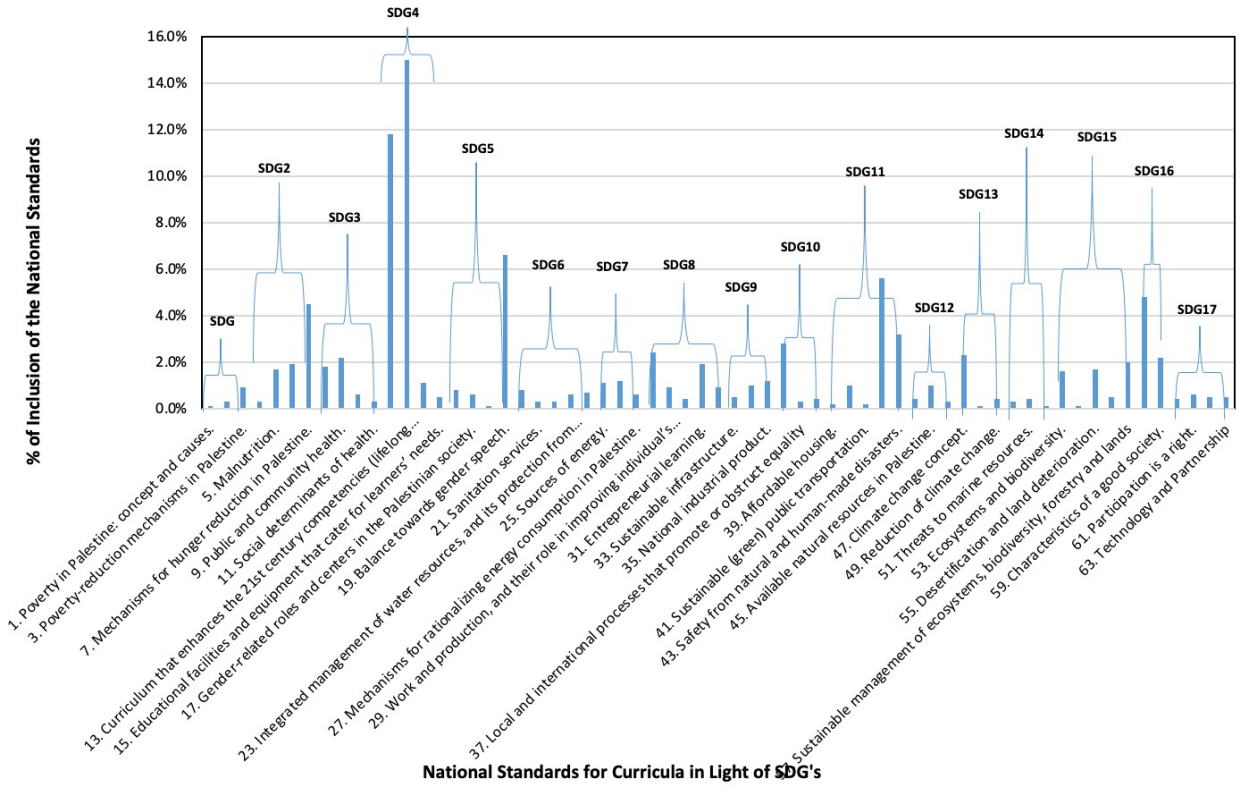

Figure 1. *Degree of inclusion of national curricular standards responsive to SDGs 2030 (%).*

[1] SDG4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Standard number (19: balance towards gender speech), relevant to SDG5[2], came in the third rank with 348 repetitions, denote 6.6% of the total. The researchers interpret that since the language of discourse used in the documents is the Arabic language, it took into account the gender of students without domination or contempt and according the Holy Qur'an. In line of that, Khaz'ali (2008) confirmed that Arabic language keeps up with the innate gender characteristics, and grammar is gender-biased.

Standards (24: cultural heritage), relevant to SDG11[3], came in the fourth rank with 297 repetitions, denote 5.6% of the total. The researchers attribute the highlight of this standard in the curriculum to the national need and vision for preserving the cultural and natural heritage. This is because they are part of the society's priority represented by liberation and development as stated in the vision of the Palestinian education system (Ministry of Education, 2016). Looking at the result from curricular issues perspective, this standard is part of the 'localization' concept, which contributes to awareness of the national identity, socio-economic interests, and national goals. It is also consistent with what Jamaha (2013) and Abu Saleh (2016) confirmed.

Then, percentages varied in a descending order until reaching to 0.1%. The lowest came for standard number (18: levels of inequality between genders), relevant to SDG5, with 4 repetitions denote 0.1% of the total (approximate to 0.1%). This standard covers crucial issues that should be target for deep awareness, including gender discrimination and social practices that reflect discrimination against women such as early marriage, forced marriage, deprivation of inheritance, denial of education right, denial of right to work, sexual harassment, and violence. The researcher consider this result is an underachievement in reflecting this standard in the curriculum.

Standard (52: Sustainable management of marine resources), SDG14[4], with 6 repetitions. Standard number (54: Forestry), SDG15[5], with 7 repetitions. The researchers attribute the low number of repetitions for the two standards, despite their importance, to the fact that the both standards are not among the Palestinian context for the absence of forests and control over sea. This interpretation meet the interest of Palestinian curriculum, which focuses on life context of learners.

Standard number (48: Adaptation to climate change), SDG13[6], with 7 repetitions. The researchers believe that this standard is essential for sustainable development. Hence, they consider the low rank of the standard is underachievement because climate change is a result of human behaviour. Accordingly, the researchers highlight that acquiring the proper behaviour, through enhancing knowledge, skills and attitude, make learners more sensitive to threats to the climate. Consistently, the World Bank Report (2010) confirmed that curriculum is the major change tool towards reducing the climate problem.

Standard number (1: Poverty in Palestine, concepts and causes), SDG1[7], with 6 repetitions.

Results and Discussion: Inclusion of SDGs in the Palestinian Curricula

Figure 2 illustrates degree (%) of inclusion of each SDG 2030 in the Palestinian curriculum.

[2] SDG5: Achieve gender equality and empower all women and girls.
[3] SDG11: Make cities and human settlements inclusive, safe, resilient, and sustainable.
[4] SDG14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
[5] SDG15: Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
[6] SDG13: Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy.
[7] SDG1: End poverty in all its forms everywhere.

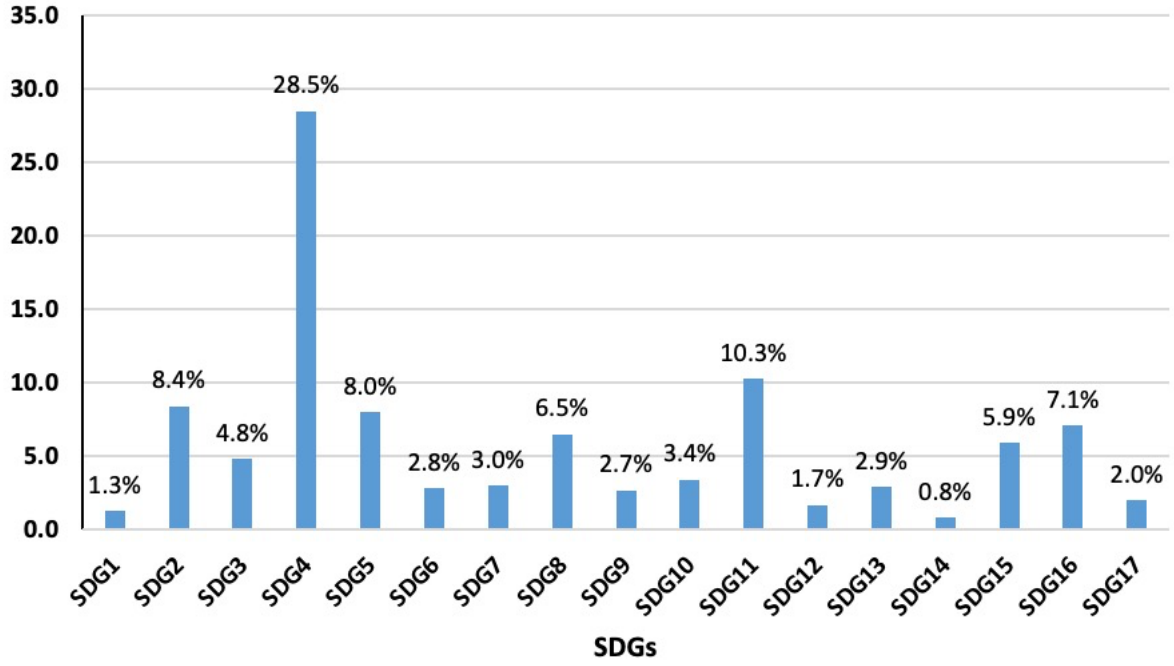

Figure 2. *Degree of inclusion the SDGs 2030 in the Palestinian curriculum (%).*

The results show that inclusion of the SDGs 2030 in the curriculum are variant. In detail, SDG4 (quality education) ranked first with 28.5%. The noticeable result related to this SDG is attributable to three reasons: firstly, having them incorporated within the General Framework for Curricula, which considered one of the most important references for preparing the guideline documents of the various curricular subjects. Secondly, the nature of SDG4 related directly to quality, which is a top priority for the Palestinian education system. Thirdly, the model used to build up the curriculum is the 'activity-based model', where quality is the core notion of this SDG.

SDG11 (sustainable cities and communities) ranked two with 10.3%. Interpretation of this high inclusion of the 11th SDG is attributable to the national vision for preserving the cultural and natural heritage, which is expressed in the relevant standards of this Goal (see Table 1). In addition, SDG11 is part of the society's priority represented by liberation and development as stated in the vision of the Palestinian education system. Looking at this result from curricular issues perspective, this standard is part of the 'localization' concept, which contributes to awareness of the national identity, socio-economic interests, and national goals.

SDG14 (life below water) was the least ranked with 0.8%. The researchers' interpretation attribute the low inclusion percentage of SDG14, despite its importance, to the fact that this goal is not among the Palestinian contextual priorities due to the absence of forests and as well as absence of control over sea.

Results and Discussion: Incorporation of National Curricular Standards Responsive to SDGs According to Curricular Subject

The result showed that the frequency and percentage obtained for each standard was calculated in each documents analyzed (Arabic Language, Science, Mathematics,

Social Studies, Technology, Agricultural Sciences, Renewable Energy, Entrepreneurship and Business, Management and Economy and Smart Buildings) as shown in Figure 3:

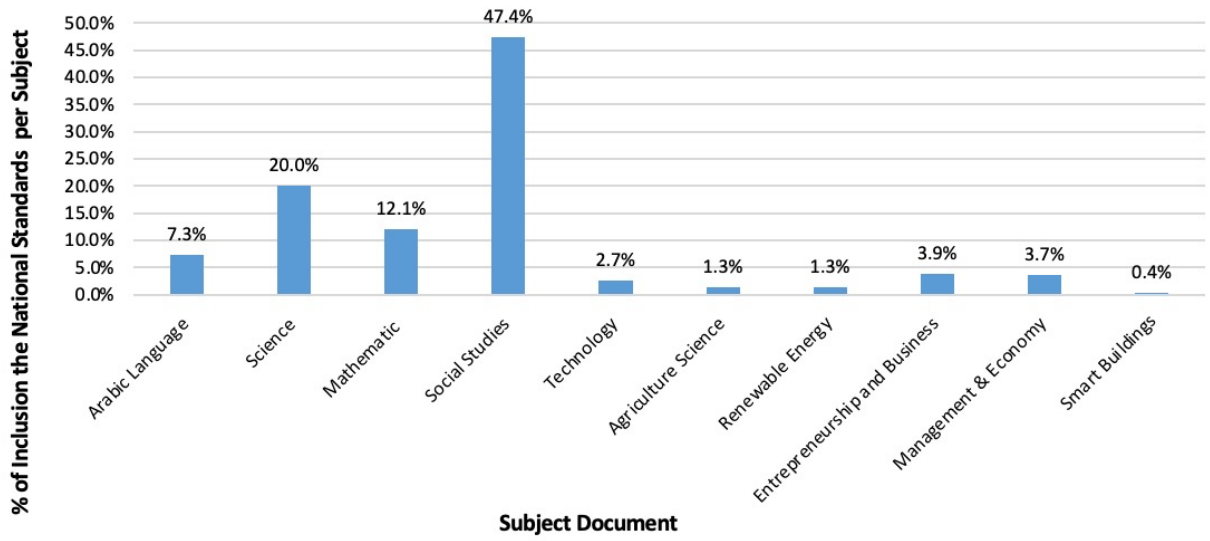

Figure 3. *Degree of inclusion of national curricular standards responsive to the SDGs accudring to subject (%).*

Rank 1: Social Studies. The results showed that the highest inclusion rate for of the SDGs-responsive standards was in the guideline document for the Social Studies subject at 47.4% (2,493 repetitions out of 5,258). In terms of type of standards covered, these repetitions cover 61 standards out of 63. Interpretation of the highest rank for the social studies is attributed to the nature of the social studies subject and its learning objectives that intersect with the SDGs. In detail, learning objectives of the social studies in Palestine are to consolidate and strengthen the sense of belonging to Palestine, develop cultural sense of belonging, awareness of the natural and social environment, to promote the values of citizenship, democracy and human rights as well as to understand social and human relations. In addition, learning objectives of social studies include developing anti-injustice, colonialism and occupation trends; build an individual who is capable of giving and sacrificing for the sake of the elevation of the homeland and its independence, as well as to promote the principles of integrity, transparency and fighting corruption. This is consistent with what was presented by Dabour and Al-Khatib (2001), Al-Hanaki (2018), and with the UK Council for Environment Education (CEE), who incorporated the concepts of sustainable development into the topics of science, history, geography, technology and national education (Al Hayari, 2014).

Rank 2: Science. The Science subject guidelines document came in the second rank with 20.0% of total repetitions (1,049 repetitions out of 5,258). In terms of type of standards covered, these repetitions cover 50 standards out of 63. The researchers attribute that large number of standards included in the Science subject to the importance of sustainable development issues, which were

recommended, locally and internationally, for inclusion in the science curriculum. This goes in line with what the Council for Environment Education (CEE) has done by introducing the concepts of sustainable development in the science subject (Al Hayari, 2014). In addition, our result goes agrees with Abu Al-Hasel (2017) who recommended the inclusion of sustainable development concepts and principles in all stages curricula in general, and the science curriculum in particular, at the cognitive, skills and emotional domains.

Rank 3: Mathematics. the Mathematics subject guidelines document came in the third rank with 12.1% of total repetitions (638 repetitions out of 5,258). In terms of type of standards covered, these repetitions cover 7 standards out of 63. This means that most of the SDG standards were absent from the mathematics subject document. The researchers attribute the result to the fact that the mathematics learning objectives over emphasized the mathematical facts and concepts. For that, Qasim and Al-Abodi (2012) called for further development of this side, emphasized the necessity for moving mathematics curricula away from focusing on pure mathematical facts and concepts towards helping students to understand the world they lives in and interact with.

Rank 4: Arabic language. Arabic language subject guidelines document came in the fourth rank with 7.3% of total repetitions (382 repetitions out of 5,258), In terms of type of standards covered, these repetitions cover 15 standards out of 63, with absence of the rest 48 standards. Within the 15 included, the focus is on standard 13 (curriculum enhancing the 21st century competencies), as it received the highest repetitions. The researchers refer the 13th standard result to its nature, which covers fundamental literacies of languages.

The rest of subjects received the following ranks and percentages: Entrepreneurship and Management (rank 5 with 3.9%), Economy (rank 6 with 3.7%), Technology (rank 7 with 2.7%), Renewable Energy (rank 8 with 1.3%), Agricultural Sciences (ranks 9 with 1.3%), and Smart Buildings (rank 10 with 0.4%).

For all of them, except Technology, inclusion of the SDGs-responsive standards was limited, which is attributable to the fact that the documents of these subjects are incomplete in terms of their parts (see methodology), and so reflected on the results of the analysis.

The technology result (rank 7 with 2.7%, and 20 standards repeated out of 63) indicates also the absence of 43 standards. The absence of them is attributable to the fact that the technology document was an old one developed in 2009, while the other documents developed in 2017, after the adoption of 2030 development agenda.

Recommendations

Based on the results of the study, the researchers recommend the following:

1. Develop agreed-upon policies on specific percentages on the inclusion of curricular issues that meet the SDGs, whether local, regional or international, within the Palestinian curriculum. This needs to be clarified in the General Framework of the Curricula and Evaluation (mother document) in order to become a reference, evidence and justification for its inclusion within the guidelines documents and in textbooks consequently.
2. Hold dialogue sessions with the curriculum development teams, document developers, and authors to inform them about the results of this evaluation, incorporating the SDGs within the curriculum and warn them about standards with low inclusion, or about standards that are absent. This shall enhance the process of studying those standards and developing a mechanism to integrate them in the curricula, as it is a requirement to cover the 2030 development goals, to which the State of Palestine is committed.
3. Reform the curriculum by moving it away from focusing on pure facts and concepts towards helping students to understand the world they live in and interact with.
4. Reformulate learning objectives listed in the guidelines document of each curricular subject in order to include aspects of sustainable development. Hence, this will facilitates the inclusion of SDGs in the matrix of the curricular subject elements.

5. Develop curricular modules including issues related to sustainable development. Such modules should be integrated into the curricular subjects in a complementary manner through utilizing the STEM approach (Science, Technology, Engineering, and Mathematics), or thorough STS approach (Science, Technology and Society), indicating that these approaches contribute to the SDGs.
6. Develop teacher-training manuals that contain the national curricular standards responsive to the SDGs, to raise their competencies in sustainable development. Such manual will help teachers in reflecting sustainable development issues their daily routine.

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