

Research Article

Building the framework of local *Adiwiyata* schools in Sintang District, West Kalimantan Province

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ABSTRACT

The suitable framework will enable schools to perform *Adiwiyata* in the best way based on their local potentials. The aim of this research was to get better knowledge about the conditions of schools awarded *Adiwiyata* as well as to analyze the specific strategies to create sustainable development of those *Adiwiyata* schools in Sintang district. This qualitative descriptive research used purposive sampling technique in which the participants were SDN 7 Sintang, SMPN 3 Sungai Tebelian, and MTsN Sintang. The data was collected through questionnaire, in-depth interview, and field observation. The data gained were analyzed using SWOT. The results indicated that the all *Adiwiyata* schools achieved outstanding scores (73.15 for SDN 7 Sintang, 70.40 for SMPN 3 Sungai Tebelian, and 68.13 for MTsN Sintang). Based on the SWOT analysis, the specific strategies to develop *Adiwiyata* schools in Sintang district were by utilizing of local unique including planting local plants, developing local culture and tradition on mutual collaboration with surrounding community, and increasing partnership with environmental agencies and the other third parties in building human resources who were reliable in maintaining environmental school program.

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INTRODUCTION

A good school need to establish a positive climate for learning including facilities and environment, It may lead to the greater learning process (Goldstein & Brooks, 2013). Clean and comfortable school environment may result the optimal learning process (Caddafie, Kariada, Martuti, Rudyatmi, & Article, 2017; Horta et al., 2017; Morton, Atkin, Corder, Suhrcke, & van Sluijs, 2016). Maintenance of school environment is the responsibility of all members in the all citizens of the school (included the principal, teachers, staff, students and all parties' affects and affected by school). Indonesia Education stakeholders also need to undertake the activities.

The *Adiwiyata* program from the Ministry of Environment and the Ministry of Education (also with the Ministry of Religion) is designed to promote a comfortable and ideal environment to improve knowledge, skills, ethics, and social norms in society (Pradini, Sudjanto, & Nurjannah, 2019). *Adiwiyata* is a popular term in Indonesia to refer to the green school program (Husin & Saleh, 2019; Rachman & Maryani, 2018; Trihantoyo & Rahma, 2018; Warju, Ariyanto, & Muzaki, 2018). Schools can be categorized as *Adiwiyata* Schools, if they have four main components; Environment-based regulations, implementation of environment-based curriculum, participatory environment-based activities, and facility management to support environmental behavior (Nurwidodo et al., 2019), however, not all schools that propose the *Adiwiyata* program have fulfilled it.

The carrying capacity of the *Adiwiyata* school program as an effort to create a caring school environment by the school community that has not been maximized can have an impact on the lack of awareness and pro-environment behavior. Sensitivity to the environment is a basic attitude to realize pro-environment behavior in all school residents (De Dominicis, Schultz, & Bonaiuto, 2017; Nurwidodo et al., 2019). Based on Estrada, Schultz, Silva-Send, & Boudrias (2017) pro-environmental behavior can arise in the community which share the same vision and interest. The citizens of the school who desire to maintain school environment are expected to be pioneer in creating clean and comfortable environment, and promote the pro-environmental behavior in the bigger scale, especially in their community. People with pro-environmental behavior generate the basic fundamentals to anticipate the global environmental issues which growth recently (Slot, Kutlaca, Medugorac, & Carman, 2018).

Environmental protection and restoration are the major challenges faced by our society, however, very few studies conducted focused in understanding the environmental behavior of its citizens (Bronfman, Cisternas, López-Vázquez, De la Maza, & Oyanedel, 2015). On this day, the problem is that many of national policy cannot be implemented well because it not crosses the localities of that area. *Adiwiyata* school program has been existing in Sintang District, West Kalimantan Province since 2011. This program is coordinated by Environmental Agencies in Sintang District. The number of *Adiwiyata* schools in Sintang district today were 34 schools consisting of four senior high schools (*Sekolah Menengah Atas/SMA/SMK/MA*), eight junior high schools (*Sekolah menengah Pertama/SMP/MTs*) and 18 elementary schools (*Sekolah Dasar/SD/MI*). These numbers are not significant compared to the total number of schools in Sintang District. The numbers of elementary schools (*Sekolah Dasar/SD/MI*) in this area are more than 450 schools. It is expected that the program will grow in all sub-districts to represent the local unique in Sintang.

Adiwiyata program who build driving force that develop pro-environmental behavior is in line with the government of Sintang district program. The Sintang regent, dr. Jarot Winarno, M.Med.PH declared that Sintang will be a "sustainable district", a program initiated by the forum named *Lingkar Temu Kabupaten Lestari (LTKL)*. It's also declare in Sintang Regent Regulation Number 66 Year of 2019 about "District Action Plan of Sustainable Sintang". The aim of this regulation is to build the economics sectors with the sustainable development strategies and promote pro-environmental behavior to all inhabitants. Based on Sintang government program above, the development of human resouces who have pro-environmental behavior is important and *Adiwiyata* program can be one of the solutions to build the driving force.

The aim of this research was to get better knowledge about the condition of school awarded as *Adiwiyata* school as well as to analyze the specific strategies in order to develop *Aidiwiyata* school in Sintang district. The importance of this research is that it can have implications for the development of the *Adiwiyata* school, especially in strengthening pro-environmental behavior in students. The suitable framework will enable schools to perform *Adiwiyata* in the best way based on their local potentials. Various efforts to develop effective strategies in organizing *Adiwiyata* or green school programs are very important to continue, which in turn can encourage students and all parties to be involved in this program. It is expected that the information to formulate the fittest strategies to gain the human resources who have pro-environmental behavior.

METHOD

This research was conducted on February-May 2019 in Sintang District. This research is a descriptive quantitative research (Booth & Gerard, 2011; Morton et al., 2016). The purposive sampling was used for selecting schools partner (Ames, Glenton, & Lewin, 2019; Etikan, 2016). The participants were three *Adiwiyata* Schools which are State Elementary School of 7 Sintang (*Sekolah Dasar Negeri /SDN 7 Sintang*), State Junior High School Sintang (*Sekolah Madrasah Tsanawiah Negeri/MTsN Sintang*), and State Junior High

School of 3 Sungai Tebelian (*Sekolah Menengah Pertama Negeri/SMPN 3 Sungai Tebelian*). The main purpose of selecting these three schools are relies on variation in its level of *Adiwiyata* and its location. *SDN 7 Sintang* awarded as *Adiwiyata* school in national level is located in center city of Sintang. *MTsN Sintang* awarded as *Adiwiyata* school in district level is located in center city of Sintang. *SMPN 3 Sungai Tebelian* awarded as *Adiwiyata* school at province level is located on the edge of Sintang near airport of Sintang (*Tebelian Airport*). The assesment of *Adiwiyata* school in Sintang will give the information about riil condition of *Adiwiyata* program. This data will be used as a foundation to build the framework of *Adiwiyata* school program based on Sintang localities.

The data was gathered through questionnaire, in-depth interview and field observation, primarily used checklist for data confirmation (Jamal et al., 2013; Rusby, Crowley, Sprague, & Biglan, 2011). The questionnaire was developed from *Adiwiyata* school assessment criteria (Ministry of Environment's Regulation number 5, 2013). Total of 11 informants (3 informants from *SDN 7 Sintang*, 3 informants from *SMPN 3 Sungai Tebeian* and 5 informants from *MTsN Sintang*) was involved in this research. The participants are conducted based on the illumination aspects. They come from different background but share similar expertise of *Adiwiyata* school management. This research informants are school stakeholders namely Principal, vice principal, teaching staff (teacher), administration staff, and other informants related to the field of the research.

The data from questionnaire was calculated and analyzed based on the guidance from Ministry of Environment's Regulation number 5, 2013. The scores taken from *Adiwiyata* school assessment then compared to *Adiwiyata* school category, as swohn in Table 1. The results from in-depth interview and field observation are used to confirm the questionnaire data (Jamal et al., 2013). Furthermore, the results from school environment assessment in all partner schools are used as a background in Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis to conclude the development strategies of *Adiwiyata* school in Sintang district (Setiawan, 2017).

Table 1. Assessment category of *Adiwiyata* school

No	Score range	Categorized	Note
1	< 56	Not <i>Adiwiyata</i> school	all <i>Adiwiyata</i> components need more upgrade
2	$56 \leq x < 64$	<i>Adiwiyata</i> school at District Level	The school will be awarded as <i>Adiwiyata</i> School at Province Level
3	$64 \leq x < 72$	<i>Adiwiyata</i> school at Province Level	The school will be awarded as <i>Adiwiyata</i> School at National Level
4	$72 \leq x \leq 80$	<i>Adiwiyata</i> school at National School	If the school can make ten (10) foster schools , It will be an independent <i>Adiwiyata</i> school* (The latest amendment of the regulation declared that three (3) foster schools are enough to be awarded as an independent <i>Adiwiyata</i> school)**
5	$72 \leq x \leq 80$ Plus 10 foster schools*	Independent <i>Adiwiyata</i> school	Verified by National <i>Adiwiyata</i> team under Ministry of Environment and Forestry

Source: (Ministry of Environment's Regulation number 5, 2013)

Note: * Based on Ministry of Environment's regulation No 5, 2013

** Based on Pers Comm. with *Adiwiyata* Program at Environmental Agency of Sintang District as PIC, 2019 (the regulation will be announced next year)

RESULTS AND DISCUSSION

Adiwiyata school assessment

The assessment toward schools categorized as *Adiwiyata* were derived from questionnaires by the school stakeholders itself (self-assessment) and observation checklist by the reseachers. Self-assessment done by stakeholders was constructed to gather the meaning in terms of pro-environmental behavior. The results of *Adiwiyata* schools assessment in Sintang District can be seen in Table 2.

The number of respondents were unequal depend on the depth of information represented by the school. The participants were respondents who were chosen based on the consideration of illumination aspects. There are three (3) participants *SDN 7 sintang* involved in the research. They are vice principal of academic affairs, who is also a Chief of *Adiwiyata* team along together with two other teaching staffs. Three participants as well are from *SMPN 3 Sungai Tebelian*. They are also on the role of Principal, Vice principal on academic affairs, and administration staff. Otherwise, there are five participants drawn from *MTsN Sintang*; Principal (in-depth interview given only), Vice principal on academic affairs, Vice principal on student affairs, administration staff, and Chief of *Adiwiyata* team.

Table 2. The results of *Adiwiyata* schools assessment in Sintang District

SDN 7 Sintang			SMPN 3 Sungai Tebelian			MTsN Sintang		
Score	Category		Score	Category		Score	Category	
	Current	Assesment		Current	Assesment		Current	Assesment
73.15*	<i>Adiwiyata</i> school at National Level	awarded as Independent <i>Adiwiyata</i> school	70.40	<i>Adiwiyata</i> school at Province Level	<i>Adiwiyata</i> school at Province level	68.13	<i>Adiwiyata</i> school at District Level	Progresse to be awarded as <i>Adiwiyata</i> school at Province level

* Three foster schools namely *SDN 8 Sintang*, *SDN 20 Mambok Sintang*, and *SDN 27 Sintang* are working jointly to learn with *SDN 7 Sintang*

Based on the result, in this study, all the *Adiwiyata* schools have implemented the program very well. From [Table 2](#), it may be seen that the assessment score is above the standard. *SDN 7 Sintang* with scores of 73.15 can be awarded as *Adiwiyata* school on national level. The presence of three foster schools of *Adiwiyata*, *SDN 7 Sintang* tended to be categorized as Independent *Adiwiyata* school. *SDN 7 Sintang* is the pioneer of *Adiwiyata* school program in Sintang Regency. The internal system is well formed. This factor make the *Adiwiyata* program can be implemented well. *SMPN 3 Sungai Tebelian* is categorized as *Adiwiyata* school on Province level with the score of 70.40. The speciality of *SMPN 3 Sungai Tebelian* is they have the large land and have good external collaboration with other organisations. *MTsN Sintang* progressed to be *Adiwiyata* school on Province level considered to be score of 68.13. This school has a program which similar to *Adiwiyata* school which is *Sekolah Sehat* (Healthy school program). This program supports the school to fulfill the criteria in *Adiwiyata* school program. *SDN 7 Sintang* has the highest score than other, 73.15 score. This school has fulfilled almost of all component in *Adiwiyata* school. The desirable outcome constructed is compatible with those of another in achievement came from the collaboration by all citizens of school ([Hunt, Barrios, Telljohann, & Mazzyck, 2015](#); [Nurwidodo et al., 2019](#)). The role of School principal and his team are very important to encourage and manage the team work in *SDN 7 Sintang*. In School management, the Principal works as the manager of school as well as the planner, the organizer, the leader, and the controller ([Pradini, Sudjanto, & Nurjannah, 2019](#); [Rizki, Azmi, Sobri, Nurabadi, & Malang, 2018](#)).

SDN 7 Sintang is located in the center of Sintang city. It's surrounded by some other schools namely State kindergarten of 2 Sintang (*TK Negeri 2 Sintang*), State Junior High School of 2 Sintang (*SMPN 2 Sintang*) and State Senior High School of 2 Sintang (*SMAN 2 Sintang*). The presence of these schools created the environmental education and greater competition in maintaining of their (environmentally friendly school program) clean and comfortable school environment. These factors structured to be key success in developing an *Adiwiyata* school ([DiMenichi & Tricomi, 2015](#); [Hunt et al., 2015](#)).

SMPN 3 Sungai Tebelian is located on Sungai Tebelian sub-district, about 17 Km from Sintang city center. The location is near of Tebelian Airport of Sintang. The development of city is in this location. The distance between the school and the city center tended to undermine the encouragement of Environmental Agencies in Sintang. The key success in encouraging the school to be *Adiwiyata* School should be fully supported by all the citizen members of school and particularly assisted by the Principal team. This school was working jointly with the village government of Sungai Ukoi to build the access road to the school. The collaboration only can be constructed with good leadership of school principal team ([Hunt et al., 2015](#)). For further development of *Adiwiyata* program, a school need to involve relevant third parties in terms of human resources ([Keselman, Levin, Kramer, Matzkin, & Dutcher, 2011](#); [Nurwidodo et al., 2019](#); [Sloot et al., 2018](#)).

MTsN Sintang is located in Sintang city center near by Baning Stadium of Sintang. the supervision in sustaining *Adiwiyata* program in this school was obtained well. The *Adiwiyata* school's score on district level reached out a number of *Adiwiyata* school on province level, as shown in ([Table 3](#)). Good management followed by all citizens of school attempt to reach the success, Educational leaders, have to think of giving direction to the followers, society and even to the world ([Luqman, Farhan, Shahzad, & Shaheen, 2012](#)). The role of the principal's team is important in maintaining a good school environment to get their influence in other schools ([Al-safran, Brown, & Wiseman, 2000](#); [Balyer, Karatas, & Alci, 2015](#); [Bredeson & Johansson, 2000](#); [Mejia, 2016](#); [Mestry, 2017](#)), and also other external support to preserve a good school environment ([Darling-Hammond, Flook, Cook-Harvey, Barron, & Osher, 2019](#); [DiMenichi & Tricomi, 2015](#); [Serdyukov, 2018](#)).

Based on the field observation, overall, the *Adiwiyata* schools environment has shown good quality of existing school environmental. *SDN 7 Sintang* has much kind of ornamental plants which plants in front of school. They also used vertical garden to address the lack of land, as shown in (Figure 1A). *SMPN 3 Sungai Tebelian* has many shade plants in school environment which provide fresh air and good condition for learning. They also have mutual collaboration with surrounding neighbor to maintenance the clean environment, as shown in (Figure 1B). In *MTsN Sintang*, they have some Palm trees which used as shade and ornamental plants. They also plants other ornamental plants in school garden but not growth well because existence of infertile soil called *Kerangas* soil, as shown in (Figure 1C).



Figure 1. School environment and school activities in *Adiwiyata* school of Sintang district A) *SDN 7 Sintang*, B) *SMPN 3 Sungai Tebelian*, C) *MTsN Sintang*

Many kinds of plants are planted in the garden, green house, vertical garden and other area. However, there is still lack of diversity. The rich of biodiversity in Sintang district is not optimally used. In constructive to this matter, the biodiversity of local fruit plants namely *Rambutan* (*Nephelium lappaceum*), *Mangga hutan* (Genus of *Mangifera*), *Belimbing Darah* (*Baccaurea angulata*), *Durian hutan* (Genus of *Durio*) are some examples of local potentials which can be planted in school environment. In doing so, the jointly work with Department of agriculture can be initiated to provide the local fruit plant seedling. The local fruit planting will lead to a sense of belonging from all citizens in the school towards their environments (Ashktorab,

Hasanvand, Seyedfatemi, Salmani, & Vahide, 2017; Kitchen, Williams, & Gallina, 2015). The home garden symbolizes the place, identity, and sense of belonging of people. Subjective elements of a home garden if realized will influence people's behavior in daily life (Belon, Nieuwendyk, Vallianatos, & Nykiforuk, 2016; Cheang, So, Zhan, & Tsoi, 2017; Ghazali, 2013; Samuelsson et al., 2018; Stoltz & Schaffer, 2018; Ten Brink et al., 2016).

The analysis of strategy-formulation framework for development of local *Adiwiyata* school program

Based on the results of in-depth interview and field observation, in general, some of the specific components of *Adiwiyata* School in Sintang district include: (1) the schools have an unwritten rule which state that if the plants were cut off, it has to be replaced with the same or better plants; (2) the disposable plastic products are forbidden to use in school area by the canteen vendors; (3) the students have to clean their own environment every day before start the lessons; (4) all citizen of school are involved to build and manage school garden, the pool, green house, medicinal plant garden; (5) all citizen of school make some handicrafts from plastic waste; and (6) the district government through Environmental Agency of Sintang District conducted some regular supervisions toward *Adiwiyata* schools.

The specific components in this formulation framework can be used as a basic fundamental in developing Local *Adiwiyata* School Program. The differences occur because of different culture and tradition in each location (Altweck & Marshall, 2015; Caddafie et al., 2017; Kitchen et al., 2015). People's perception about waste are vary depend on how it benefits them. People who live near the Waste Management Facility (WMF) will have different visions to people who live in high class settlements. The waste is one of income sources to people who live near the WMF. All citizen of the school will process the waste into useful things which has economic values such as organic fertilizer, plastic handicrafts and so on. The different visions about waste also appear in the society who lives in the city and the village. Urban people usually use the household waste namely plastic bottles, cans, clothing and so forth. Meanwhile, villagers usually deal with the organic waste namely leaf, branches, animal waste, and so on. All These different perceptions about waste will lead to particular paradigm in order to formulate specific development strategies. According to Ferronato & Torretta (2019) environmental contamination due to solid waste mismanagement is a global issue, measuring the comprehensive impact and planning of solid waste collection with a good treatment system, will increase awareness of sustainable waste management.

Based on field observation, Sintang district has some local unique to support the development of *Adiwiyata* school program. It include: (1) the rich of fruit plant diversity in Sintang district which can be cultivated in school environment; (2) many universities support the development of local human resources in anticipating global environmental issues which growth recently; and (3) people in Sintang still preserve culture and tradition based on their sense of belonging to the environment.

This local unique can be used as a foundation of formulating sustainable *Adiwiyata* school. The further analysis of specific strategies in developing *Adiwiyata* school or SWOT analysis in Sintang district can be seen in Table 3. The local uniqueness from Sintang regency is a key factors to develop the local *Adiwiyata* school program. Based on S-O strategies in Table 3, the local government and also school board can develop the regulation to plants the local fruit plants as shading, ornamental plants, and medicinal plants in school environment. The sustainable district program (*Program Kabupaten Sintang Lestari*) is also supporting factor to develop local *Adiwiyata* school program. Local government through Environmental Agency is open to collaborate to school and provide the knowledge and guidance to improve the quality of school environment. Local tradition of helping each other is good tradition to implement in school and surrounding neighbor. The utilization of district specific localities is also implemented in other area like in West Sumatra which used the local wisdom of Minangkabau to improve the identity of *Adiwiyata* school (Astuti, 2017).

Based on the results of school environment assessment, in-depth interview and SWOT analysis (Table 3), some specific strategies can be formulated to develop the local *Adiwiyata* school in Sintang district: (1) Improving students' sense of belonging on students toward the environment by doing planting, preserving, and harvesting of local plants such as local vegetables, local fruit plants, local shade plants and so on. (2) Utilizing a culture of mutual cooperation around community to preserve the school environment. It can be started by cleaning up the Village facilities such as Village office, village drainage, and so on. (3) Formulating the working group of adjacent school in term of sharing knowledge and skill about managing the *Adiwiyata* school. (4) Building a formal-open access website/online sharing media/social media/campaign media (should be initiated by Environmental agency of Sintang district) to accommodate the publication of pro-environmental activities from all *Adiwiyata* school in Sintang district.

Table 3. SWOT analysis used in formulating strategies for development of local *Adiwiyata* school program in Sintang District

Internal factors	Strengths	Weaknesses
	<ol style="list-style-type: none"> 1. The school stakeholders made some effective environment-based strategic regulations 2. Strong leadership of school principal and colleagues 3. 20% of school fund is allocated to the management of school environment 4. Human resources are qualified to develop environment-based teaching materials 	<ol style="list-style-type: none"> 1. Not all citizen of school has pro-environmental behavior yet 2. lack of human resources who are reliable to manage the school environment 3. lack of plants diversity in school garden 4. lack of publicity in terms of environment-based activities
External factors		
Opportunities	S-O Strategies	W-O Strategies
<ol style="list-style-type: none"> 1. Varieties of fruit plants which are appropriate to plant in school garden 2. Full support from Environmental Agencies in Sintang District 3. Good tradition of mutual cooperation in the community 4. The opportunities to collaborate with third parties in term of sharing knowledge and publication 	<ol style="list-style-type: none"> 1. to formulate environment-based regulations in planting local fruit plants in school environment 2. to increase the collaboration between school and Environmental Agencies to manage the school environment 3. to elaborate good fund and collaboration with local communities in maintaining school environment 4. to increase the knowledge and skills of school's human resources through the collaboration with third parties 	<ol style="list-style-type: none"> 1. planting local fruit plants to develop PEB of all citizen of school 2. Conducting the partnership with Environmental Agencies to supervise school professional environment technicians 3. to conduct the collaboration with surrounding community to maintain school environment 4. to increase the collaboration with the third parties in developing social media contents related to school pro-environmental activities
Threats	S-T Strategies	W-T Strategies
<ol style="list-style-type: none"> 1. The society habit of littering 2. The small number of parent who do not understand the importance of PEB 3. The climate change issues in school environment 4. The distance between school location and city center affects the quality and intensity of school assistance from Environmental Agencies 	<ol style="list-style-type: none"> 1. to build the PEB about littering to school society 2. to conduct the routine meeting between Principal team and student parents regarding to the importance of school environmental cleanliness 3. to manage school budgets in providing pro-environmental facilities 4. to utilize the qualified teaching staffs in developing creative ideas for school environment 	<ol style="list-style-type: none"> 1. to involve all citizen of school and surrounding community in maintaining school environment 2. to improve the participation of student parents in doing pro-environmental activities 3. to increase the number of local shade plants so that it can create comfortable learning atmosphere in school environment 4. to utilize the use of online campaigns in order to improve the mentoring and socialization of pro-environmental activities

Building the collaboration networking with universities in Sintang district which has knowledge and skills about developing and preserving the environment. Ensuring quality in creating the environment is a shared responsibility, by developing a cultural network of social responsibility (Pero, Moretto, Bottani, & Bigliardi, 2017). Effective collaborative teams exhibit important outcomes, far beyond what could be accomplished by individuals working independently (Cheruveilil et al., 2014).

CONCLUSION

The results from *Adiwiyata* school assessment indicates that the school is implemented the program very well. Its known from the score of assessment 73.15 in *SDN 7 Sintang* (plus three foster schools they can be categorized as Independent *Adiwiyata* school), 70.40 in *SMPN 3 Sungai Tebelian* which categorized as *Adiwiyata* school on Province level, and 68.13 in *MTsN Sintang* which progressed to be *Adiwiyata* school on Province level. Every *Adiwiyata* school in Sintang district has their specialty, in *SDN 7 Sintang* they are surrounding by three schools in different level which make a good competition to maintain their environment clean. *SMPN 3 Sintang* is used their collaboration with local community to build the facility around the school. *MTsN Sintang* has a good internal leadership and support from surrounding environment to clean their school. Based on SWOT analysis, the specific strategies on developing *Adiwiyata* school in Sintang district include utilizing of local uniqueness such as planting of local plants, developing of local culture and tradition on mutual collaboration with surrounding community, and increasing partnership with Environmental agencies and third parties in developing the professional human resources in maintaining school environment.

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