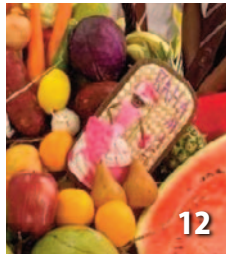# ADVENTIST EDUCATION

ChatGPT in the Classroom:
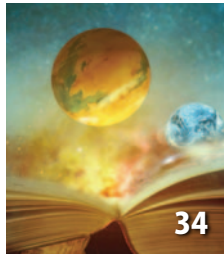
Uses, Limitations, and Student and Teacher Experiences

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Andrew Mutero

House of God and Gate of Heaven

One of our major strengths as Adventists is a unique philosophy of education that seeks to develop the whole person physically, mentally, and socially in a world where education has a strong bias for only mental development. The Seventh-day Adventist Church has been called at such a time as this not only to *preach* the third angel's message but also to *teach* the message.[1]

We are reminded of Jacob, who was faced with fear and an uncertain future. Genesis 28:11 says that Jacob left Beersheba and set out for Haran. He was running away from his brother Esau, whom he had betrayed and who was seeking revenge, and Jacob was afraid for the future. In this time of uncertainty, he "stopped for the night because the sun had set. Taking one of the stones there, he put it under his head and lay down to sleep" (Genesis 28:11, NIV).[2]

But in a moment of despair, sometimes a dream comes! Jacob "had a dream in which he saw a stairway resting on the earth, with its top reaching to heaven, and the angels of God were ascending and descending on it" (Genesis 28:12). Majestic ambassadors of God were conducting business between heaven and earth. Most encouraging to Jacob, "there above it stood the Lord" (Genesis 28:13). At the top of every stairway in life stands the Lord. We can trust Him with our future.

This dream was all grace. Jacob was not seeking God—he was fleeing the consequences of his deception. He was not expecting grace, yet the vision and the voice of God bore only assurances. Jacob could never go beyond God's keeping. Grace had brought Jacob safe thus far, and grace would lead him home.[3]

What can we learn from the experience of Jacob? At today's crossroads, we must:

- **Have a dream for our Adventist schools**. The Lord is sitting on His throne, watching over us, and the angels are there to minister to us and connect us to the throne of God (Genesis 28:12).
- **Wake from our sleep and think**, paying close attention to our schools and our dreams for them: "When Jacob awoke from his sleep, he thought, 'surely the Lord is in this place, and I was not aware of it'" (Genesis 28:16).
- **Recognize and admit** that "surely the Lord is in this place," and sometimes we may not be aware of it.
- **Declare in reverence,** "How awesome is this place!" Could our schools become the house of God and the gate of heaven in our communities?

Just like Jacob, we are apprehensive and concerned about the future. What is the future of Adventist education? What will happen to our schools? Where do we get the much-needed resources? The Lord is assuring us today: "'I am with you and will watch over you wherever you go, and I will bring you back to this land. I will not leave you until I have done what I have promised you'" (Genesis 28:15).

ChatGPT in the Classroom:

Uses, Limitations, and Student and Teacher Experiences

The education world has entered the first full school year, 2023-2024, with generative Artificial Intelligence (AI). It was in early 2023, the middle of last school year, when the introduction of ChatGPT sparked a wave of apprehension among teachers. Fears were rampant that this advanced technology would disrupt the educational landscape. As we navigate through the first full year of its implementation, we begin to see its potential benefits and understand its potential drawbacks. Educators continue to explore and better understand the implications of this innovative technology and will continue to do so for some time into the future.

Despite initial fears, generative AI is showing promise in helping educators with their jobs and offering new opportunities to students. At the same time, the current limitations of the technology may cause a variety of unexpected consequences.

ChatGPT is not the only source for generative AI. There are dozens, if not hundreds, of similar Large Language Models (LLMs) performing variations of the same process. Some notable apps include Google's Bard, Microsoft's Bing Chat, Socrat.AI, and Anthropic's Claude. ChatGPT was the first widely known model, publicly released in November of 2022. In this article, therefore, I use ChatGPT as a shorthand for all generative AI, even if some tools act somewhat differently.

LLMs Infiltrate Education

ChatGPT was the fastest public tech deployment in history. Facebook took two years to reach one million users. Instagram took two and a half months. ChatGPT took five days.[1] This quick implementation created tension in classrooms as teachers wanted to address its use but didn't know how, especially given the rapid developments and changes. Any thoughts of bringing it up were tempered by the possibility that they might be giving away the secret to the

BY LORIN KOCH

most efficient cheating method that has ever existed.

Teachers need not have worried about that—their students already knew. Students aren't ignorant about technological development. They pay attention to news, albeit usually through YouTube videos or social media. A former student of mine, who graduated from 12th grade in 2023, says students learned about ChatGPT online, through memes and TikTok posts, and then a popular TV episode[2] midway through the school year. Another former student, a 10th grader last year, says YouTube videos discussed ChatGPT as far back as November 2022. This student was an early adopter, signing up in December and spreading the word to other students in January and February of 2023.

Early reactions included excitement (by students) and horror (by teachers). Teachers and professors were concerned that ChatGPT would immediately make essay writing obsolete, as students could complete their papers in seconds with very little effort. Would this be the end of the essay? The end of homework altogether?

Before long, almost everyone knew about ChatGPT. Students at my Adventist school who were confident of their ability to write their own thoughts were perhaps less tempted, but younger or less-mature students saw it as a shortcut to avoid tasks seen as time-consuming, difficult, or annoying. One student was not proud to admit using it on assignments, but the ability to get out of doing work was too strong to ignore. This student used ChatGPT both to help with brainstorming and to write full papers, which then needed editing. If saving work was the goal, ChatGPT didn't come through: The time spent fixing the issues in the AI-generated papers was longer than the time it would have taken to write the paper.

The Possibilities of AI in Schools

As the technology became better known and its use more widespread, some teachers began to shift from hor-

ror to guarded optimism, coming to see ChatGPT as another tool in their educational toolbox. Nathaniel Whittemore, host of the podcast *The AI Breakdown*, says that educators and students are always among the first adaptive users of new technology.[3] Technology has presented this type of possibility many times. To offer a comparison, the calculator disrupted the way math classes were taught, but after a period of resistance, teachers quickly learned to adapt their curricula to the new tool.[4]

> **ChatGPT simply has no way of fact-checking its information. Like an unprepared student giving a presentation, it is trying to use the text it knows to sound plausibly human, which sometimes results in very confident-sounding but very incorrect information.**

Generative AI presents another sort of challenge. This technology was totally unknown to the majority of educators just a year ago. However, if teachers can be open to the opportunities provided by generative AI, it offers many beneficial uses. Box 1 on page 6 contains a list of ways generative AI can be used in the classroom that the author has gathered from various sources and teachers' experiences.

Many more ideas can be found online. Free idea lists exist, such as a list of more than 100 creative ideas in Zenodo.[5] Also, researchers are beginning to publish books on the topic.[6] Many of the ideas in the list in Box 1 came from Shah or Skrabut, among other sources. OpenAI also introduced a set of blog posts, help tools, and FAQs at the beginning of the 2023-2024 school year for educators dealing with generative AI.[7]

What Limitations Can Teachers and Students Expect?

While generative AI seems to provide impressive text most of the time, it does have a variety of shortcomings that all users should understand. Teachers need to know that ChatGPT and other AI models will often lack common sense, be inaccurate, and make up details. Students should also be aware of AI's tendency to make things up and the fact that it has very little ethical guidance. Also, currently, there seems to be limited access to high-quality peer-reviewed materials that exist behind paywalls of reputable journals.[8]

ChatGPT's issues with common sense and accuracy are both a result of the fact that the model doesn't actually understand words or language.[9] The computer "brain" is simply predicting what it thinks you want to hear based on mathematical calculations and probability. ChatGPT breaks letters and words down into binary numbers, and it has no idea whether its information is accurate or not. This makes for some puzzling interactions, such as these:

User: How many R's are in the word 'Idiosyncrasy'?

ChatGPT: There are three R's in the word 'Idiosyncrasy.'

User: Explain your answer. Locate all of the R's.

ChatGPT: I apologize for the incorrect response in my previous answer. There are actually two R's in the word 'Idiosyncrasy.' Here's the correct breakdown:

The first R appears after the letter 'i.'

Box 1. Ways Generative AI Can be Used

Creating plans for class
- Generating lesson plans on a specific topic
- Sequencing material
- Formulating topics of study for different focus groups
- Creating interactive activities (such as science labs) on a specific concept
- Defining collaborative tasks
- Suggesting performance tasks that align with learning objectives

Generating text for classroom use
- Creating class discussion topics
- Assembling quiz questions
- Writing distractors for multiple-choice questions
- Compiling case studies for a topic being studied
- Writing samples at different reading levels
- Creating computer code for specified tasks
- Assembling PBL or STEAM projects related to a topic
- Taking existing questions and remaking them into a more interactive project
- Generating a "Jeopardy" question board for review

Differentiation
- Offering enrichment for gifted students
- Identifying tips for helping ADHD students
- Zone of Proximal Development – Sets of increasingly difficult tasks
- Generating tasks at different levels of Bloom's Taxonomy

Ideas for non-academic areas
- Bulletin board themes
- Icebreaker activities
- Group activities
- Spiritual programming
- Generating a classroom newsletter – Tell ChatGPT to ask you a series of questions about what's happening in your class, and then have it write the news articles

Help with grading
- Giving immediate feedback on student understanding
- Summarizing text
- Creating rubrics
- Outlining writing
- Explaining errors in writing

Creative classroom applications
- "Respond as a literary character" – Students get into a book by having a "conversation" with one of its characters
- "Be a debating partner" – Students test their arguments by having the AI assess and poke holes in their arguments
- "When am I ever going to use this?" AI can answer this age-old student question
- Have ChatGPT write the first draft of a paper, and then give students the task of fact-checking the AI
- "Give me an array of potential perspectives" on a topic
- Use ChatGPT as a socratic dialogue tool

Help with difficult situations
- Writing reference letters for students
- Creating letters to parents that deal with a variety of topics

Reminder: Never disclose personal information to an AI chatbot. The conversations may be kept for training purposes and may be viewed by many people!

The second R appears after the letter 'o.'

__User__: What is 6257 x 962?

__ChatGPT__: The product of 6257 multiplied by 962 is 6,022,834.

__User__: No it isn't!

__ChatGPT__: I apologize for the error in my previous response. Let's calculate the correct product of 6257 multiplied by 962:

6257 x 962 = 6,014,134

So, the correct result is 6,014,134. Thank you for pointing out the mistake.[10]

(By the way, the correct answer is 6,019,234.)

Why would it make such a basic mistake like the number of R's in a word, or the answer to a multiplication problem that any calculator gets correct? Remember that LLMs are trained on online text. It is very unlikely that anyone online has ever asked how many R's are in the word *idiosyncrasy*. They wouldn't need to: Anyone who can recognize letters can count the R's. Similarly, while it is very likely that the multiplication problem 7 x 5 is on numerous websites, the problem above may not be on any Internet source. The AI has to do its best to come up with what it "thinks" you want. It's pretty close both times! But neither answer is accurate. In the above examples, ChatGPT has very little to draw on from its training data.

This also helps explain why ChatGPT has a tendency to make up information. Observers sometimes refer to this as hallucination, but some researchers prefer the term *confabulation* to keep from over-humanizing the computer models.[11] ChatGPT simply has no way of fact-checking its information. Like an unprepared student giving a presentation, it is trying to use the text it knows to sound plausibly human, which sometimes results in very confident-sounding but very incorrect information. A prominent example of this was the story of the lawyer who used ChatGPT to help prepare for a case, and ended up citing six cases by name, none of which actually existed![12] (This true story

should be mentioned to all students who might be tempted to use generative AI.)

One other point is related to the fact that text generated by LLMs is sometimes hurtful and negative. Because ChatGPT is the sum of the material that makes up its source data, it may give information and advice that could be biased or hurtful. While programmers have given LLMs the goal of being helpful and appropriate, think about all of the text you've seen on the internet. How much biased or hurtful text is online? That should give you an idea about some of what an LLM has to sift through as it tries to be helpful to humans.

AI and Christian Schools

Faith-based schools have some specific concerns and opportunities related to the use of generative AI. A major area of interest for believers is the fact that AI was created by humans. God created humans in His image and bestowed us with a spark of divine creativity, which we then used to build technology in our image. AI technology is not human consciousness, of course. But programmers want AI to respond like a human would, and this brings up significant questions about the ethics of how we want it to relate to us.

A 2022 dissertation discusses in depth the topic of ethics in AI.[13] In this study, the author interviewed several people who work in fields that bridge the intersection of faith and technology. These interviews discuss how the ethics desired and generated by programmers, such as efficiency and accuracy, differ from Christian ethics, such as humility, altruism, sacrifice, mercy, and love. Several of the interviewees discussed the possible benefits of including love in ethical systems, compared to attempts to program ethics into AI.

Concerns mentioned earlier, such as bias and harmful content, relate directly to generative AI's ethical programming. Other major ethical considerations brought up by critics of AI include the use of deepfakes, the ability to protect private data, and

fears of turning over human decision-making to AI.[14] Huizinga's interviewees suggest that including God in the ethical programming of AI could alleviate some of those concerns. When the reason for ethics is based on God first loving us, we act ethically as a way of uplifting others toward God. But when an ethical system is based on efficiency, accuracy, and *avoiding* specific content, it is likely that it will not act in ways that truly benefit people. As much as we

> Imagine a classroom in which the teacher is taking an unorthodox approach to learning. Instead of posting learning objectives and key learnings, the teacher tells the students, "Do whatever comes to mind. I have a goal for you, and I'll let you know if you're getting close. Try stuff!"

may think of AI as a human intellect, it is helpful to remember that it is a tool programmed in ways that do not necessarily include love for all humankind.

As a tool, ChatGPT can still provide a lot of benefits, even specifically to the unique needs of people at Christian schools. Generative AI offers exceptionally good programming suggestions for spiritual events and services. Consider a busy school chaplain who has a Week of Prayer to plan. ChatGPT could quickly provide

cohesive themes, engaging activities, and reflection questions to connect students' coursework to concepts presented in the meetings. But there is always the concern of accuracy. While ChatGPT knows a lot about the Bible, it may not provide material that is theologically sound or accurate to the original text.[15] This rule of thumb for students also applies here: Use AI for ideas but do your own work. God calls us to speak the truth in love (Ephesians 4:15). Teachers and spiritual event planners should make sure that the AI suggestions they use are in line with their beliefs, keeping in mind the ethical concerns discussed above.

What Is ChatGPT Doing?

When ChatGPT comes up with something odd, and we don't know why, it's an example of what is known as the "alignment problem."[16] This is when the goals of the AI don't match up with our goals for it. In these situations, there is literally no way for us humans to understand why it did what it did because it has to go through multiple trillions of calculations to provide answers. A good step in understanding why LLMs confabulate and introduce errors is to gain some understanding about what the computers are actually doing behind the scenes.[17]

Imagine a classroom in which the teacher is taking an unorthodox approach to learning. Instead of posting learning objectives and key learnings, the teacher tells the students, "Do whatever comes to mind. I have a goal for you, and I'll let you know if you're getting close. Try stuff!"

As the students "try stuff," the teacher keeps giving them a thumbs-down. Writing on the board gets a thumbs-down. Drawing a picture gets a thumbs-down. Opening a science textbook gets a thumbs-down.

Out of exasperation, one student gives up and heads over to the Lego corner, and the teacher, surprisingly, gives a thumbs-up! Reinvigorated, the students start grabbing Legos and putting them in different configurations. Eventually, they create a model of a

subtraction problem: 8 Legos - 5 Legos = 3 Legos. Without ever being told the objective, the students arrive at a correct answer.

This is, on a very small scale, how ChatGPT was trained. Instead of programming in rules and logical tests, the computer was asked questions. If its answers were good, humans essentially gave it a thumbs-up. In the classroom scenario above, with the time constraints of a school day, it's very possible that the students might never determine the teacher's goal. But repeat this process millions, or billions, of times, and you get a computer that is fairly good at answering in a way humans will understand. This is probably not the best way to teach a class of students. The teacher knows the students arrived at a correct answer, but doesn't really know what they understand, if anything. That is basically what happens with the answers given by ChatGPT.

Tasks LLMs Do Poorly

Looking at this whole picture, teachers may feel a sense of hopelessness about whether they can avoid ChatGPT taking over their students' homework. Some might be tempted to give up trying to teach accuracy, writing, basic comprehension, or even critical thinking since LLMs can do it so well and don't seem to "care" when they fail. This would be an understandable reaction, but one that needs to be looked at honestly.

The two teachers I interviewed for this article both said they don't think ChatGPT should take the place of traditional skills of writing, organizing, and putting concepts together. Even if generative AI can do basic tasks well, it is still important for students to be able to do them. One of the teachers mentioned that students need rudimentary skills in order to pursue higher-order skills. Having AI do those simpler tasks could cause teachers to rush to more complex skills, leaving behind students who need help with

lower-order skills and creating gaps in understanding.[18]

Reflecting on this idea, one teacher commented that we need to avoid all-or-nothing thinking about technology. Not all academic skills have to be done using the Internet, or even typed. Critical-thinking skills are often best learned in conversation or through activities in class. Furthermore, even if ChatGPT can write a sonnet, that doesn't mean people should stop writing sonnets.

> **Teachers can also structure class time to have students complete tasks in school rather than on their own, where the opportunity to use an LLM is greater.**

That being said, it is still valuable to have an understanding of tasks that ChatGPT either currently can't do or struggles to do well. This list is most useful for teachers who are attempting to minimize the likelihood that students will try to use generative AI to do their classwork.

LLMs are bad at…

• Analysis of specific data from images or video shown in class: LLMs have begun to be able to understand what is in images, but still struggle to comprehend the significance of material in images and videos.

• Analysis that draws on, or cites, class discussion. Tasks that reference what happened in class can only be completed by people who were there.

• Personal reactions to specific cited sources: Teachers can ask students to respond to, and evaluate, specific material with their own understanding. LLMs can "pretend" to

apply information to their "lives," but a real-life connection will be much more vivid.

• Themes: Because they don't have a sense of overall cohesion, LLMs struggle with big-picture analysis, and with using a smaller illustration of a larger concept. They tend to repeat themselves, or even contradict themselves, on longer passages.

In addition to the points above, teachers can also structure class time to have students complete tasks in school rather than on their own, where the opportunity to use an LLM is greater. For instructors looking to teach important writing skills, pointers for use of class time include:

• Assign in-class writing;

• Have students brainstorm and pre-write by hand. (Requiring students to hand-write essays and longer passages is not recommended.[19] Additional adaptations might need to be made for students with other learning needs);

• Break down writing into smaller steps that can be completed in class;

• Require the use of some specific sources to which every student has access;

• Hold individual writing conferences where you ask students to explain their reasoning.

Catching ChatGPT in the Act

The two Adventist teachers I talked to for this article both caught their students using ChatGPT last school year. They reflected on how strange it was to discover this. Both of them knew on a first read-through that the papers were not written by students. The language didn't reflect how the topic was discussed in class, and the work didn't "match" what the students produced earlier in the school year. Additionally, the content was described as being "thorough, past the point that most students would stop talking about something," but also vague at the same time.

When confronted with the evidence, most of the students admitted

using ChatGPT right away. One of the students claimed to only have used it to edit his writing and check grammar, although the teacher felt dubious about this assertion.

Both of the teachers I talked to reported being hesitant to bring up generative AI with their students. When teachers haven't used ChatGPT much themselves, they may not be confident in attempting to inform others about it. One of the teachers didn't know anything about ChatGPT before catching it in her classroom. She knew the paper wasn't written by a student but didn't know what it was. Putting it through a plagiarism detector didn't help, and she felt confused.

Can You Use ChatGPT to Catch ChatGPT?

Toward the end of the 2022-2023 school year, dozens of companies began to come out with tools designed to catch AI-generated text in assignments. These tools, called "classifiers," seemed to promise to be the new version of plagiarism checkers. OpenAI released its own classifier in January of 2023, with the warning that it was wrong a lot of the time.[20] It could accurately classify AI text only 26 percent of the time, which of course meant that it missed 74 percent, and wrongly classified human-written text as AI nine percent of the time!

The theory was that classifiers would get better with time, and eventually be able to tell with a high degree of certainty whether a human or a computer wrote text. This did not prove to be true. AI-generated text is much more difficult to catch than plagiarized text, which was likely published somewhere else. The challenge is that AI-generated text doesn't already exist anywhere, so classifiers have to look for other characteristics of text. For some comparisons, computers are more predictable than humans, usually completing sentences in the way others do, and more consistent with sentence length and structure.

With those characteristics, it might seem possible to determine whether text is human-generated. But thus far, they are not reliable indicators.[21] A lot of computer-generated text is still unflagged (false negatives), and human-written text is often flagged (false positives). Wrong classifications have consequences. Wrongly failing students over false positives is unfair, and succeeding by passing off false negative AI-generated text as one's own is unethical.

False positives have caused significant upheaval already, such as when a college professor threatened to fail his entire class over ChatGPT use.[22] Even worse is the fact that English-language learners are more likely to have their writing falsely flagged as AI-generated, likely due to predictable writing limited by vocabulary.[23]

The classification problem is so bad that some teachers might be tempted to just ask ChatGPT if it wrote something. Responding to that idea, OpenAI stated in their Teacher Guide FAQ that asking ChatGPT if it wrote something will fail: "ChatGPT has no 'knowledge' of what content could be AI-generated or what it generated. It will sometimes make up responses to questions like 'did you write this [essay]?' or 'could this have been written by AI?' These responses are random and have no basis in fact."[24]

OpenAI offers some suggestions, though, for teachers hoping to avoid the problem of students turning in AI-generated text as their own.[25] Suggestions include incorporating generative AI in class, teaching the students how to use it ethically and responsibly, and having students show their work throughout the process.

Conclusion

Generative AI has the potential to revolutionize the way we teach and learn. With the explosion of LLMs such as ChatGPT, we are seeing a new world of personalized learning that can help students and teachers alike. However, it's important to remember that these models are still relatively new and unpredictable. Their limitations need to be understood as teachers (and students) use them in classes.

As we move forward integrating AI into our classrooms, we would do well to remember the ethical considerations involved. Teachers and students alike need to be aware of the limitations of AI, including confabulation, inaccurate information, and the potential for bias and questionable content. Teachers need to take steps to mitigate these risks and educate their students.

Ultimately, the success of generative AI in education will depend on how well we can balance the benefits with the limitations. By working together to develop best practices and guidelines, and sharing our successes, we can ensure that this technology is used responsibly and effectively. ✐

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Promoting Plant-based Diets
in Seventh-day Adventist Schools

God has given human beings guidelines for the type of diet that is best, one that identifies food that will provide health and vitality to live healthful lives. In the Genesis record, God said: "'I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds in the sky and all the creatures that move along the ground—everything that has the breath of life in it—I give every green plant for food.' And it was so" (Genesis 1:29, 30, NIV).[1] Also, in *The Ministry of Healing,* Ellen White noted that grains, fruit, nuts, and vegetables constitute the diet chosen for human beings by the Creator. These foods are the most healthful and nourishing when prepared simply and naturally. They impart strength, a power of endurance, and a vigor of intellect that are not obtained from a more complex and stimulating diet.[2]

Adventist education promotes wholistic mental, physical, social, and spiritual development. Learning about food and nutrition at school helps students understand God's plan for their overall health. Schools can also help parents learn how to provide for their children's nutritional needs at home to better support wholistic learning and development. Teaching and implementing plant-based approaches to eating is one way Adventist schools can do this.

Why Plant-based Diets?

Plant-based diets are becoming popular globally for several reasons, including the prevention and treatment of chronic human diseases such as hypertension, obesity, and type 2 diabetes. Emerging evidence indicates that plant-based diets, usually high in fiber content, can help to lower the production of uremic toxins, and this helps the gut microbiome.[3]

The increased interest in plant-based eating has led to increased production and accessibility of meat and plant-based dairy alternatives such as soya, oat, almond, and coconut plant-based drinks, plant-based oils, and vegetable spreads.[4] There has been an increase in food appropriate for vegetarian and vegan diets, which can be considered a part of a plant-based dietary regimen. Restaurants, food outlets, and snack companies have in-

BY SHONDELL DeVELDE

dicated increased sales and consumption of snacks made from seeds, nuts, and pulses (legumes).[5]

Health and environmental concerns are two major driving forces behind the shift to plant-based diets. Studies have shown an association between the high intake of red and processed meat and an increase in some forms of cancer. The increased interest in plant-based diets is also linked to ethical, animal welfare, and environmental concerns. Some people believe that changing the frequency and types of food eaten can reduce the pressure on the global food system. Consuming more plant-based products, as encouraged by most dietary guidelines globally, helps to protect the environment.[6] An important decision that a person can make to prevent chronic diseases and improve overall energy and health levels is consistently consuming diets high in plant-based foods.

What Are Plant-based Diets?

Plant-based diets are dietary patterns that focus on foods from plant sources. These foods include fruits, vegetables, beans, legumes, whole grains, proteins, seeds, nuts, and oils. Students and their parents may voice concerns that plant-based diets cannot meet dietary needs; however, this approach to eating can provide almost all the nutrients necessary for optimal health. These nutrients include proteins, carbohydrates, fats, vitamins, and minerals. Continuous research provides extensive evidence about the benefits of plant-based diets to human health. These benefits include but are not limited to the following:

1. Supports the immune system. Plants have essential nutrients that are not obtainable from other foods. These nutrients are minerals, vitamins, antioxidants, and phytochemicals, which keep the body's cells healthy and balanced to ensure that the immune system can function at its best. In addition, plants help the body fight infections, strengthen the immune system, and protect the body against germs and microorganisms.[7]

2. Reduces inflammation. The essential nutrients in plants, which include antioxidants and phytochemicals, help to fight inflammation and boost the immune system, neutralize toxins from pollution, bacteria, processed foods, and viruses, and help fulfill many other processes. Antioxidants capture all the free radicals that can cause imbalances in the body.[8]

3. Helps maintain a healthy weight. One of the most important things people can do to reduce their risk of chronic diseases is to maintain a healthy weight. Excess weight causes inflammation and hormonal imbalance and increases the risk of developing chronic disease, specifically several different types of cancers. A plant-based diet reduces the consumption of foods that lead to weight gain and combined with a balanced intake of calories and an active lifestyle, can prevent obesity.[9]

4. Increases fiber consumption. Fiber is a component of plant structure; therefore, consuming the required amount of fiber provides several benefits, such as improving gut health, which will help with the absorption of the nutrients from foods that support the immune system and
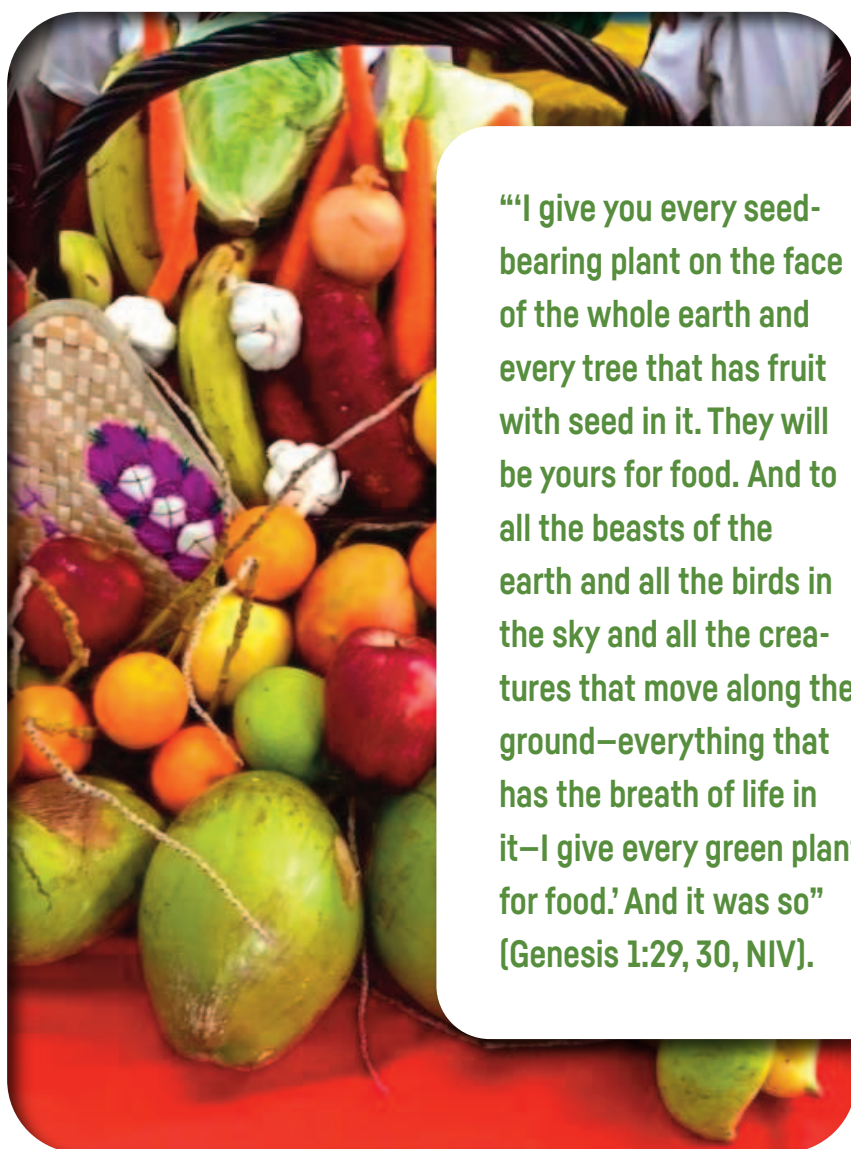
"'I give you every seed-bearing plant on the face of the whole earth and every tree that has fruit with seed in it. They will be yours for food. And to all the beasts of the earth and all the birds in the sky and all the creatures that move along the ground—everything that has the breath of life in it—I give every green plant for food.' And it was so" (Genesis 1:29, 30, NIV).

reduce inflammation. Fiber also lowers the level of cholesterol, stabilizes blood sugar, and aids with regulating the digestive system.[10]

5. Offers healthy alternatives. Eating plant-based meals does not necessarily guarantee that one avoids the trap of consuming foods high in fat and sugar. Many school cafeterias tend to serve high-fat, high-sugar, and high-sodium snacks or foods prepared in a way that reduces their nutritional value. Obtaining the maximum nutrients and benefits from cooked foods and specific vegetables requires appropriate cooking methods. Cafeteria managers should choose foods with the highest nutrient density: whole grain, high fiber, unprocessed, and organic foods, instead of processed foods such as white bread, white rice, and pasta made from white flour. They should choose 100 percent whole-wheat bread and pasta, and brown rice. They should also limit desserts high in sugar, fat, and carbohydrates, which consumed consistently in high quantities, contribute to weight gain. Careful attention must be given to appropriate cooking methods that preserve the nutritional value of foods. Foods from plant sources are essential to sustain health; consuming appropriate amounts of them will help the body's system work efficiently.

Planning Balanced Plant-based Meals

Eating a healthful, balanced diet is paramount to maintaining good health and helps people feel their best. A balanced diet means eating the required proportions of food from the five food groups: fruits, vegetables, grains, proteins, and dairy. Food from plant sources such as fortified soy alternatives, almond milk, cashew milk, oat milk, etc., are alternatives for those who choose to eliminate dairy or are unable to process it. However, before transitioning to a plant-based diet, individuals with a medical condition or special needs should seek advice from a registered dietitian or a physician.[11] This is especially important in schools where individuals may have specific dietary needs. Contracting the services of a registered dietitian or having one on staff can be beneficial when planning and preparing to meet the needs of the school population.[12]

The main characteristic of plant-based eating is a high intake of plant-based foods. Even though these foods vary or have different food components, the recommended composition of a healthy plant-based diet generally includes the following:

• Vegetables, fruit, and whole grains;

> Consuming a nutritious plant-based diet requires that individuals be aware of their nutrient needs and the sources of those nutrients. After obtaining that knowledge, they can plan and prepare a diet that provides them with the daily required nutrients for optimal health.

• Low-fat dairy products (or dairy alternatives), nuts, seeds, legumes;

• Unsaturated fat;

• Lower intakes of processed or refined grains, sugar-sweetened foods, and beverages.[13]

Some suggestions for helping students eat a healthy, balanced, plant-based diet:

• Promote eating at least five portions of a variety of fruits and vegetables every day.

• Prepare meals from higher-fiber, starchy foods like potatoes, bread, rice, or pasta.

• Offer some dairy or dairy alternatives such as soya drinks and almond milk.

• Incorporate beans, pulses, and other proteins.

• Choose unsaturated oils and spreads, and eat them in small amounts.

• Promote drinking plenty of fluids, at least six to eight glasses of pure water each day[14] and consider situating water stations throughout the school.

Nutritional Limitations of Plant-based Diets

Consuming a nutritious plant-based diet requires that individuals be aware of their nutrient needs and the sources of those nutrients. After obtaining that knowledge, they can plan and prepare a diet that provides them with the daily required nutrients for optimal health. Grains, fruit, and vegetables are found in large quantities in plant-based diets and provide adequate nutrients in plant foods such as carbohydrates, fiber, protein, and vitamins. Plant-based diets should provide the most natural nutrients such as carbohydrates, fiber, protein, healthful fats (polyunsaturated, monounsaturated), and macro- and micronutrients in adequate amounts.

However, physicians and nutrition professionals have opined that a strict plant-based diet usually lacks vitamin B12, vitamin D, and calcium, which are mainly derived from animal sources. Vitamin B12 (cobalamin), is naturally found in animal foods and is an essential nutrient to the body as it keeps the blood and nerve cells healthy, makes up DNA, the genetic material of all cells in the body, and, along with vitamin B9 (folate), helps to prevent megaloblastic anemia. This blood condition makes people tired and weak.[15]

On the other hand, vitamin D promotes intestinal calcium absorption and helps maintain adequate blood levels of calcium and phosphorus, which is necessary for healthy bone mineralization. An adequate vitamin D intake supports good immune system function and reduces the risk of autoimmune diseases. The human

body produces vitamin D as a response to sun exposure.[16] It is highly recommended that individuals who consume plant-based diets should find alternative ways of obtaining these nutrients. These alternative sources may include supplements as recommended by their physicians and the consumption of fortified foods with these nutrients.[17]

Transitioning to a Plant-based Diet

For some individuals, transitioning to a plant-based diet can be challenging. Human beings are creatures of habit. Transitioning from consuming animal to plant food sources requires changes in people's eating habits and dietary behaviors. Habits are formed when behavior is frequently and consistently performed in the same context.[18] An example of habitual behavior is children frequently and consistently eating fruits at snack time. At some point, eating fruits at snack time will become a habit. The regular co-occurrence of context and behavior creates an association that may guide future behavior.[19]

Transitioning to a plant-based diet can be challenging if there is a lack of affordable and available foods needed to sustain a balanced diet. "Food deserts" are areas where 20 percent or more of the population live in poverty or have limited access to stores that sell nutritious foods such as fresh fruits and vegetables. These are real challenges for which communities are still trying to find solutions; however, some recommendations include utilizing frozen produce, dried beans, and legumes or accessing community gardens.[20] Additional garden options, especially where there is limited space, include raised bed gardens, container gardens, or scrap gardens (typically used for fresh herbs).[21]

Behaviors modeled at school can be encouraged at home. Here are suggestions that schools can share with parents through newsletters, in-school seminars, or cooking classes:

Recommendations for Transitioning to a Plant-based Diet

1. *Eat a variety of vegetables*. Choose a variety of vegetables, including many colors, for lunch and dinner. Enjoy vegetables as a snack with sauces made from other vegetables, such as low-sodium salsa or hummus.

2. *Change the way you think about meat.* Use smaller portions in your meal until it is eliminated from your diet.

3. *Choose healthy fats*. Fats in olives, olive oil, nuts, seeds, and avocados are healthful sources of good fat.

4. *Prepare a plant-based meal for dinner at least once per week*. The plant-based meal should be built around vegetables, beans, and whole grains.

5. *Include whole grains for breakfast*. This includes oatmeal, quinoa, buckwheat, barley, rice, bread, and other whole grains and seeds.[22]

6. *Use green leafy vegetables*. Eat a variety of green leafy vegetables such as kale, spinach, collards, Swiss chard, and other greens each day. Steam, grill, braise, or stir-fry to preserve the nutrients and their flavor.

7. *Build a meal around a salad*. Eat a bowl with romaine, spinach, or red leafy greens salad. Add a mixture of other vegetables and fresh herbs, beans, peas, or tofu. Careful attention should be given to food preparation to avoid food-borne illnesses such as E. coli.[23]

8. *Eat fruit for dessert*. Use fruit in various forms such as juice, whole, diced, sliced, and pureed.[24]

Can Plant-based Diets Support Sustained Growth for Children?

When children consume plant-based diets, a common concern is nutritional inadequacy; as a result, parents who choose to provide plant-based diets for their children as well as school food-service managers need to be knowledgeable about the nutritional adequacy of the foods children consume daily. Consuming unplanned and unbalanced plant-based diets can increase children's risk of not meeting the daily required nutrient intake of some nutrients like vitamin D, vitamin B12, calcium, iron, and omega-3 fatty acids.[25]

Like their peers who consume animal-based diets, children eating well-planned plant-based diets can receive adequate nutrients, grow well, and enjoy sustained health. Children's protein and energy needs can be met by fortified cereals, bread, rice, or pasta served with various sources such as beans, peas, nuts, legumes, and unsaturated fats. Similarly, whole-grain foods and vegetables are sources for children's mineral requirements, but some minerals such as zinc and iron may be lacking in the diet; hence, supplements and fortified food sources may be needed to meet the daily requirements. Children who consume plant-based diets obtain their proteins from only plant sources. Therefore, food service managers and parents should carefully choose the food sources and use a combination of plant-based proteins to ensure that their children consume the daily required intake of protein (see Sidebar 1 on page 15).

Evidence-based Practice in Schools

Evidence-based nutrition education will help children develop appropriate food and nutrition habits. Teaching children and their parents to prepare and choose a wholesome plant-based diet can be a means of helping children practice healthful living behaviors. The foundation for good health across the lifespan is developed during childhood.

Like the home, schools provide a great immersive experience to teach and help children and families learn about planning, shopping, and preparing healthful meals. The food and nutrition curriculum in schools should provide training in food skills and opportunities for extra-curricular activities, including food services, community nutrition, and health evangelism. For this reason, facilitating nutrition education in schools as a standalone discipline that is both concept and skill-based is beneficial to

students because it can achieve the end goal of helping them become knowledgeable about food and its importance to the body.[26]

Evidence-based opportunities

As the homeroom teacher of the 7th grade in a Seventh-day Adventist school, I incorporate aspects of nutrition education in my family-life classes. I teach children that their bodies are the temple of God, and He expects them to take care of them. Children are taught that healthful eating is one of the ways God expects them to take care of their bodies (see Sidebar 2 for a survey of my students).

Evidence-based nutrition education will help children develop appropriate food and nutrition skills.[27] The students' responses to the survey, observing their dietary behaviors at school, and knowledge about healthful eating provide extensive opportunities for me to promote plant-based eating in school.

My current work setting stipulates that only vegetarian meals should be prepared and served on the school's campus. Most of the student population are not Seventh-day Adventists, and they need to know the school's policies and nutrition guidelines regarding school meals. Even though students are not forced to choose plant-based meals, they will be exposed to the health benefits of making good food choices and encouraged to increase their daily intake of fruits and vegetables.

The students surveyed indicated that they do not have a kitchen garden, nor are they involved in backyard farming, which is an increasing practice in the local community. The students also indicated that having a kitchen garden could help increase their intake of fruits and vegetables. These dynamics provide opportunities for the school to promote and establish a school garden to teach children how to grow fruits and vegetables, provide opportunities for physical activity and social interaction, and even offer a source of income for the school, all of which will extend beyond the parameters of the school setting. Promoting a plant-based diet in Seventh-day Adventist schools also promotes opportunities for community nutrition and health evangelism.

Conclusion

In 1 Corinthians 10:31, the apostle Paul wrote, "So whether you eat or drink or whatever you do, do it all for the glory of God" (NIV). Preparing and serving healthful, attractive plant-based meals is an excellent way to help children and adults embrace the plant-based lifestyle. Sharing tasty, nutritious recipes that require inexpensive ingredients and are simple and easy to prepare is also a way to engage and facilitate a change in attitude toward plant-based eating. For most individuals, transitioning to such a diet requires careful planning, budgeting, time management, and commitment to positive dietary changes. This is because some of the nutrients required for the optimal functioning of the body can be obtained only from a combination of plant-based sources.[28] Individuals preparing and serving plant-based meals, particularly to children, should ensure that the meals consist of foods from each food group, including fruits, vegetables, healthy carbohydrates, and proteins. All these nutrients are excellent nutritional sources for a healthful diet.

At every stage of a person's life, healthful eating is necessary. In the case of children, parents and teachers are responsible for teaching them about healthful food choices and eat-

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Sidebar 1. Strategies for Helping Children Eat More Plant-based Foods

The following strategies can be shared with parents through newsletters, in-school seminars, or cooking classes:

• Teach children about the recommended amounts of fruits and vegetables they should eat daily.

• Be a role model to children by eating the recommended number of fruits, vegetables, and other plant foods each day.

• Ensure that children eat the recommended fruits and vegetables daily. Surveys can be used to do this (see Sidebar 2 on page 16 for an example).

• Encourage children to eat a variety of fruits and vegetables to avoid their getting bored with the same fruits and vegetables.

• Involve children with choosing recipes and meal preparation, as this will help them to become more interested in eating the food they prepared.

• Use fruits and vegetables in their various forms for snacks and desserts. For example, unsweetened smoothies, diced fruits, fruit drinks, etc.

• Take children grocery shopping, and allow them to choose the fruits and vegetables they want to eat.

• Choose a day each week when one entire meal will consist of food from plant sources.

• Teach children about the different types of nutrients found in specific plant foods and the importance of those nutrients to their health.

• Prepare attractive, delicious, and healthful plant-based meals.

• Have a kitchen garden and teach children to grow their food. For those living in areas where there is limited space, community gardens, container gardens, or scrap gardens are alternative options.

I developed and conducted a survey for my 7th-grade class to in May 30, 2023, to determine their views of plant-based meals. The class had 10 students. Five were Seventh-day Adventists, and five were non-Seventh-day Adventists. This small group is not generalizable to a global population; however, it provides a glimpse into how students in my context (Freeport, Bahamas) respond to plant-based eating. The interview questions and students' responses are as follows:

Do you understand what the phrase "plant-based meal" means?

Six students believed a plant-based diet consisted of foods from only plant sources, while four of them believed that a plant-based diet consisted primarily of foods from plant sources in addition to some animal sources.

Have you ever had a meal consisting of only food from plant sources?

Four students said they had never eaten an entirely plant-based meal. Six students stated that they had had total plant-based meals before, and two of them who are Seventh-day Adventists indicated that they eat entire plant-based meals at least once per week.

Can you share one of your typical daily meals?

All the students ate similar foods daily despite being from diverse backgrounds. These foods were rice, chicken, peas, meat, eggs, sausage, bread, and fruit drinks. There was a noticeable absence of fruits, vegetables, and grains other than rice from the students' daily meals.

Do you think that people should eat only food from plant sources?

Only two students believed they should eat a plant-based diet only, and these two students were Seventh-day Adventists.

Do you eat fruit and vegetables every day?

Three of the10 students indicated that they ate fruits and vegetables some days.

What are some of your reasons for not eating fruits and vegetables daily? (Students could choose more than one option.)

Six students said fruits and vegetables were too expensive to eat daily. Five students said that they did not like fruits and vegetables. Three students said they were tired of eating the same type of fruits and vegetables; as a result, they did not eat them daily.

Do you think eating fruits and vegetables every day is good practice?

Five of the students believed that eating fruits and vegetables every day was good practice.

Do you believe that you should increase your daily intake of fruit and vegetables?

The five students who indicated that eating fruits and vegetables every day was a good practice also indicated that they should increase their daily intake of fruit and vegetables.

Does your family have a kitchen garden, or are they involved in backyard farming?

All the students indicated that they did not have a kitchen garden, neither did they have an opportunity to be involved in backyard farming.

Do you think if you had a kitchen garden, it would increase your intake of fruits and vegetables?

All the students believed that they would increase their intake of fruit and vegetables if they grew them.

ing practices, which may include reading food labels, shopping for nutritious foods, and preparing, serving, and storing healthful foods. Parents and teachers should teach and help children understand the importance of eating a balanced variety of fruits, vegetables, protein foods, grains, and alternative dairy products. These are good strategies for helping children to appreciate plant-based meals. Healthful plant-based eating also entails consuming nutrients in their required amount to meet the daily required nutrient intake and limiting the consumption of sodium, trans fats, and added sugars. ✏

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27. Harvard T. H. Chan School of Public Health, "School Obesity Prevention Recommendations: Complete List" (2020): https://www.hsph.harvard.edu/obesity-prevention-source/obesity-prevention/schools/school-obesity-prevention-recommendations-read-and-print.

28. Some examples of this include grains combined with legumes such as bean soup and crackers or black beans and rice; or nuts and seeds combined with legumes such as garbanzo hummus or lentils with almonds. For more examples, see Shereen Lehman, "Complete Protein Combinations for Vegans" (2023): https://www.verywellfit.com/vegan-protein-combinations-2506396; Kerry Health and Nutrition Institute, "Nutrition for Plant-based Diets: Managing Nutrient Intake and Bioavailability" (2020): https://khni.kerry.com/news/nutrition-for-plant-based-diets-managing-nutrient-intake-and-bioavailability/.

Rick Warren and Ellen G. White on Christian Character Development:

An Unexpected Meeting of the Minds?

"Character is the diamond that scratches every other stone," according to Josephson.[1] It is a claim that points to the pervasiveness and significance of character in human relationships.

Character building has arguably become an important contemporary educational issue in the broader educational world as indicated by acclaimed work and publications such as the following:

• *Character Strengths and Virtues: A Handbook and Classification*[2];

• *Moral Education the CHARACTER-plus Way*[3];

• *Grit: The Power of Passion and Perseverance.*[4]

Educator and philosopher George Knight perceives character building as a remit (task) of Christian education, and asserts it is part and parcel of Christian schools' *raison d'être* in the "telling of the biblical metanarrative."[5] That, indeed, the task of character building is taken seriously is reflected by a prospectus content (aimed at parents and carers) that is typical of many Christian faith-based schools in Australia:

"The development of character is fundamental to our pursuit of academic excellence and is at the heart of our teaching and pastoral care. . . . We are thoughtful about what we do, with a wholistic view of Christian education that sees community, curriculum, *character* and systems as inextricably linked."[6]

It is expected, given the above-stated goals, which include character development, that teachers become crucial and indispensable role models in such schools.

Following the preamble, it is appropriate, now, to introduce two Christian authors—Rick Warren and Ellen White—and then proceed to examine and focus on what each author has written about aspects of character development that is relevant to a wide audience.

Background and Context

Although Warren and White's lives (1954–… and 1827–1915) did not intersect, they have much in common. Their theological perspectives, backgrounds, and life experiences in many ways share certain contours.

With roots in North America—Rick Warren in the west, in California, and

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Ellen White born in the east, in Portland, Maine—both individuals were co-founders of their church/faith groups. Warren's formerly Southern Baptist-affiliated Saddleback megachurch now has a reported membership of more than 20,000, after inauspicious and humble beginnings in 1980, while White's original, insignificant group of [Millerite] Christian Advent believers (officially organized in 1863 as the Seventh-day Adventist Church) has grown globally to more than 20 million adherents.

The two authors have been widely published, consequently being influential and successful. Translated into more than 20 languages, *The Purpose Driven Church*[7] and its 2002 successor, *The Purpose Driven Life*,[8] have sold millions of copies. Correspondingly, tens of millions of White's *Steps to Christ*[9] are still in circulation. The small book on basics of Christian living has been translated into 165 languages. White's prolific works (more than 5,000 periodical articles and nearly 30 books) and voluminous periodical articles and tracts) include the five-book Conflict of the Ages series, central to which is *The Desire of Ages*, a classic on the life of Christ.

In their own time frames, neither Rick nor Ellen, in leadership roles, have been strangers to criticism or malignment (but for different reasons), and each has had to deal with family tragedy (both having lost a young son in distressing circumstances) and experienced recurrent personal health issues that impacted their lives.

There are also a number of shared theological perceptions, that may be "distilled" from their published works, which should not go unnoticed. Some of these may be summarized as follows:

• believing that all Scripture is God-inspired;

• adhering to an Arminian understanding of the gospel, i.e., human free will responding in faith and cooperating with God in salvation—*vis-à-vis*—predestination;

• upholding the biblical Reformation doctrine of justification by faith in Christ;

• committing to a trinitarian conception of God;

• demonstrating a missionary passion for communicating and spreading the gospel;

• advocating believer baptism by water immersion;

• professing the literal second coming of Christ;

• building and supporting faith communities that exhibit order, structure, and flexibility;

• holding a penchant for order, planning, and discipline, not as an end in

> **In an interview, Angela Duckworth, professor and CEO of Character Lab, describes character as, "all the things you habitually do, think, say and feel that are good for others and good for you."**

itself, but for the teaching and advancement of the gospel.

Moreover, as believing and practicing Christians, the two hold some interesting views on *character* development and its importance in the Christian life. Prior to examining and discussing these views, it is prerequisite to "unpack" the concept of "character" as referenced by academics, ethicists, moral education literature, Christian educators, and Scripture.

Character: What It Is/Is Not

In an interview, Angela Duckworth, professor and CEO of Character Lab, describes character as, "all the things you habitually do, think, say and feel

that are good for others and good for you."[10] She sees character development as a lifelong project and differentiates between values and character. For instance, one might value generosity, but not necessarily be a generous person.

Academics Marshall, Caldwell, and Foster perceive (good) character as a complex, multi-faceted concept. They argue, as part of their CHARACTERplus Way® approach to moral education that it extends beyond the demonstration of "'a mixed bag of virtues,'"[11] to one of the discerning application of virtues for the greater good, without regard to extrinsic rewards; sometimes in the face of contradictory goals and values dilemmas, and being able to employ "sharp" reasoning and analytical skills. More will be said about this perception further on in the article, in relation to Warren and White.

Timpe, in *The Internet Encyclopedia of Philosophy,* contends, "what kind of person one is, is constituted by one's character; the link between moral character and virtue is clear. We can think of one's moral character as primarily a function of whether she has or lacks moral virtues or vices."[12]

Regrettably, *character* is currently often understood as merely referring to *personality.* A recent case in point was sports journalist Tracey Holmes' report at the Beijing Winter Olympics. When the father of gold medalist snowboarder Ayumu Hirano was asked to explain the extraordinary success of his son, he was reported as saying: "The most important thing in the world is personality."[13] Unless accuracy was "lost in translation," the expressed view is a typically emasculated one.

Writing from a Christian perspective, ethicist Wayne Grudem defines character in terms of character traits and virtues as, "habitual dispositions to act, feel, respond and think in morally good ways."[14] For Christians, good being the moral standards found in God's law and a reflection of His character, as revealed in Scripture and also written (even if imperfectly perceived) on people's hearts and consciences.[15] By implication, responding in morally bad ways leads to negative

character traits—that is, vices.

Knight goes further; confronting his readers with a provocative claim: "*true* character can develop only in the born-again Christian. Character development outside that experience may be good humanism, or even good pharisaism, but it is not congruent with the Christian model."[16] In Knight's view, "leading young people into a saving relationship with Jesus Christ [and] service to God and other people for both the here and hereafter,"[17] constitutes authentic character development that also includes developing a Christian mind, social responsibility, physical health, and development for the world of work. In Knight's paradigm, Christian education should be concerned with students' salvation, where teachers are committed followers of Jesus and active agents bringing students "back to 'at-one-ment' with God, other people, their own selves, and the natural world."[18]

It is noteworthy that the New Testament makes several specific references to character.

"Now you must tell them the sort of *character* which should spring from sound teaching. The old men should be temperate, serious, wise—spiritually healthy through their faith and love and patience" (Titus 2:1, Phillips).[19]

"We can rejoice, too, when we run into problems and trials, for we know that they help us develop endurance. And endurance develops strength of *character*, and *character* strengthens our confident hope of salvation" (Romans 5:3, 4, NLT).[20]

"Yet when it [discipline—correction of behavior that God allows or is the result of natural consequences] is all over, we can see that it has quietly produced fruit of real goodness in the *characters* of those who have accepted it in the right spirit" (Hebrews 12:11, Phillips).[21]

"Wherever that gospel [of love, truth, grace, faith and hope] goes, it produces Christian *character*, and develops it, as it has done in your case" (Colossians 1:6, Phillips).[22]

What can be deduced from the apostle Paul's inspired statements about Christian (and by implication, "good") character, noted above? First, from a biblical perspective, it is honorific and desirable. Second, character, whether bad or good, does not come with our DNA at birth, but is developed. Additionally, good character is not easily or quickly attained, for it involves struggles to bring about changes in our human behavior that

> **Character, whether bad or good, does not come with our DNA at birth, but is developed. Additionally, good character is not easily or quickly attained, for it involves struggles to bring about changes in our human behavior that are not temporary, but which are stable and endure over time.**

are not temporary, but which are stable and endure over time. Third, character formation is linked to behavior; our actions. Fourth, "fruit of real goodness" suggests that the fruit of the Spirit (Galatians 5:22, 23), is a basic ingredient of Christian character, as believers choose to lead Spirit-empowered lives and become transformed (Romans 12:2). The fruit metaphor also brings to mind Jesus addressing the issue of whether a bad tree can produce good fruit, and vice versa (Luke 6:43, 44).

For this article, what steps were taken to obtain Warren and White's views and understandings on character?

The Authors' Perceptions

To ascertain their perceptions, statements about specific aspects regarding character have been taken from major works of Warren and White. With a view to potential concurrence, they were arranged in a table format (see page 22). In examining the quotations in Table 1 (in subsequent discussion, all numbered paragraphs cited, e.g., 1, 2, 3a, etc. refer to Table 1), and keeping in mind the set of Bible verses quoted above, several features become evident:

The Significance of Character

Both Warren and White recognize the importance that is placed on character in Scripture. Actually, character's import stretches from the mistrust of Adam and Eve, in the opening chapters of the Book of Genesis, to the sentence pronounced on the unrepentant in the concluding chapter of Revelation. Conversely, its positive import extends from Enoch and Noah, who both "walked with God" (Genesis 5:24; 6:9), to the doers of God's precepts in the ending of Scripture (Revelation 22:14).

Jesus' description of the judgment in Matthew 25 spotlights that character traits have a bearing on salvation—not that these have any salvific merit *per se*—but in that they reflect the immeasurable, unfailing love and grace that God has extended to humanity. Also, that one's responsive human acts or virtues reveal authentic living according to the Great Commandment of Matthew 22:36-40.

Statements by the writers (Table 1, 1) leave the reader in no doubt about their parallel views on the priority placed on character development in Christian education. Education philosopher George Knight also underscores this significance, by referring to Christian teachers as "agents of reconciliation" (following Jesus' example).[23] For these teachers, character devel-

Table 1. Selected Quotations About Character From the Published Works of Rick Warren and Ellen G. White (italics supplied).

Note: The quotations below have been taken from Warren's two major books; the White quotations come from her books, and also from compilations (sourced from White's articles, tracts, and letters) posthumously published.

Rick Warren	Ellen G. White
1. "Christlike character is the ultimate goal of all Christian education. To settle for anything less is to miss the point of spiritual growth" (PDC, 359).	1. "Its [true/Christian education's] goal is character building. The highest class of education is that which will give such knowledge and discipline as will lead to the best development of character" (CG, 296).
2. "The fruit of the Spirit is a perfect picture of Christ. . . . If you are going to develop Christ-like character you must have these qualities in your life as well" (PDC, 361).	2. "In our character building we must build on Christ. He is the sure foundation. . . . In our character building, Christ is our example" (CG, 166). [The fruit of the Spirit comprises] "the elements of the Christian character" (CG, 173).
3a. "Developing the *character* of Christ is life's most important task because it is the only thing we'll take with us into eternity" (PDC, 360).	3a. "A *character* formed according to the divine likeness is the only treasure that we can take from this world to the next" (MYP, 100).
3b. "Jesus made it quite clear . . . eternal rewards in heaven will be based on the *character* we develop and demonstrate here on earth" (PDC, 360).	3b. "The harvest of life is *character*, and it is this that determines destiny, both for this life and for the life to come" (Ed, 108).
4. "The Christian life is far more than creeds and convictions; it includes conduct and *character*. Our deeds must be consistent with our creeds, and our beliefs must be backed up with Christlike behavior" (PDL, 183).	4. "A profession of religion places men in the church, but the *character* and conduct show whether they are in connection with Christ. If they bear no fruit, they are false branches" (DA, 676).
5a. "Even the smallest incident has significance for your development. Every day is an important day, and every second is a growth opportunity to deepen your character, to demonstrate love, or to depend on God" (PDL, 43).	5a. "Faithfulness or neglect in what are apparently the smallest duties may open the door for life's richest blessings or its greatest calamities. It is little things that test the character" (PP, 158).
5b. "Your habits define your character. There is only one way to develop habits of Christlike character: You must practice them—and that takes time!" (PDL, 221).	5b. "Character does not come by chance. . . . It is the repetition of the act that causes it to become habit, and molds the character either for good or evil" (MYP, 163).
6. "Character development always involves choice. When we make the right choice, our character grows more like Christ. Whenever we choose to respond to a situation in God's way instead of following our natural inclination, we develop character" (PDC, 360).	6. "Without freedom of choice, his [Adam's/human] obedience would not have been voluntary, but forced. There could have been no development of character" (PP, 49).
7. "God is far more concerned with our character than he is with our comfort. . . . For this reason he allows all kinds of character-building circumstances: conflict, disappointment, difficulty, temptation, times of dryness, and delays" (PDC, 361).	7. "Christ has given us no assurance that to attain perfection of character is an easy matter. . . . A noble character is earned by individual effort through the merits and grace of Christ. . . . It [character] is formed by hard, stern battles with self" (MYP, 99).

Key to abbreviations used in Table 1

PDC – *The Purpose Driven Church*   PDL – *The Purpose Driven Life*   MYP – *Messages to Young People* *   Ed – *Education*   CG – *Child Guidance**
DA – *The Desire of Ages*   PP – *Patriarchs and Prophets*   * Indicates a posthumous compilation sourced from the author's articles, tracts, and letters.

opment in students is a major goal of their teaching ministry, their educational priority not being to inform or conform, but to *transform.*

It is of interest that an emphasis on character development, particularly in Christian faith-based schools, is meeting parents' perceived expectations and gaining their appreciation. At the turn of the century, Buckingham[24] named ethos and discipline as contributing factors in parents' choice of non-government schools. Similarly, Justins and Sauber's research found, "parents involved in Christian Parent Controlled Schools send their children primarily for purposes that are consistent with their Christian beliefs and way of life" (p. 8).[25] Two decades later, Spencer notes a 14 percent enrollment increase from 2021-2022 in Christian Schools Australia (CSA), on the 9 percent high of the previous year, as part of a long-term trend. While there may be diverse reasons for parents' choice of CSA schools, Spencer concludes, "there is clearly a strong desire for education built on strong and explicit values and beliefs . . . and the desire is continuing to grow."[26]

Even parents without religious affiliation increasingly recognize that virtues and moral values are essential elements of character development and want these to be part of their children's formal education. This may be indicated, to a certain extent, by a continuing, long-term growth of enrollments, also, in Independent Schools (ISA),[27] that are part of the overall Australian non-government schools sector. ISA schools are often typified by their educational emphasis on competency, conservatism, and character.

Which Character Qualities?

Unsurprisingly, secular sources or texts about character—namely about its make-up, development, or importance—are not mentioned by either author. Their focus is entirely a biblical one. Love, joy, peace, longsuffering, gentleness, goodness, faith, meekness, and temperance (Galatians 5:22,

> Even though one's personal efforts contribute to character development, for the Christian believer, these qualities have their grounding and source in God.
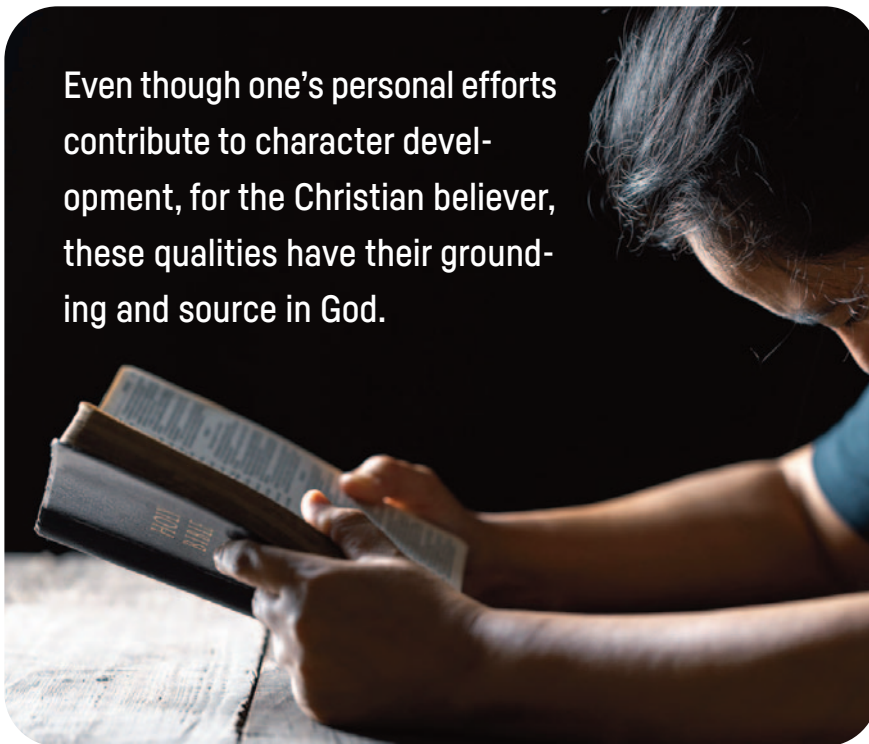
23, KJV) are upheld as most desirable character qualities; being the fruit of the Spirit (Table 1, 2) of which many other virtues are subsets or derivations.

Even though one's personal efforts contribute to character development, for the Christian believer, these qualities have their grounding and source in God. Indeed, it may be argued that any and all goodness, irrespective of who exhibits it (non-believers included), has its roots in the Creator God, because human beings of themselves, are incapable of engendering it (Isaiah 64:6). Jesus' disciples are encouraged to follow in His footsteps.

The Perpetuity of Good Character

What surprises about both statements 3a, in Table 1, is that a Christlike character is the only "possession" that mortals may take into eternity; this assertion, notwithstanding of:

• Paul the apostle's statement, ". . . we brought nothing into this world, and it is certain we can carry nothing out" (1 Timothy 6:7, KJV);

• Job's agonizing acknowledgement, "'Naked I came from my mother's womb, and naked I will depart'" (Job 1: 21, NIV)[28]; and

• Solomon's conclusion, "People come into this world with nothing, and when they die, they leave with nothing. In spite of all their hard work, they leave just as they came" (Ecclesiastes 5:15, NCV).[29]

However, Jesus' parable of the rich fool (Luke 12:16-21, 33), and the immediate sequel for the benefit of His disciples, differentiate between *material possessions* and an enduring, incorporeal treasure in heaven, safe from earth's familiar threats. That treasure, Warren and White would claim, is more than a metaphor, but the essence of our being, our spiritual fingerprint or DNA; more specifically, character.

Statements 3b in Table 1 assert the connection between the present life and a future one, with character being a significant link. Readers are reminded of Jesus' declaration: "'I am the resurrection and the life'" (John 11:25, NCV), prefixed by Martha's strong conviction, "'I know that he [Lazarus] will rise and live again in the resurrection on the last day'" (John 11:24, NCV). Scripture does not provide us with details of the process of

the character "transfer." However, at death, the "breath" of God that gives life (Genesis 2:7) returns to the Giver, together with our "spiritual DNA" to be reunited with our resurrected bodies—transformed and perfected in Christ—with the time and circumstances outlined in 1 Thessalonians 4:13-17 and 1 Corinthians 15:52; yet to be realized and fully understood.

Character and Conduct

Not "walking the talk" is a common criticism of some of today's public figures—politicians, business leaders, celebrities, and sporting greats. In the latter category, to mention merely one recent example, a former Olympic kayaker and his younger brother were sentenced to 28 and 25 years jail, respectively, for trying to smuggle an estimated $200 million worth of cocaine into Australia.[30] The failure to live up to promises and meet exacting standards of conduct is increasingly becoming acceptable, commonplace practice, with the resulting compartmentalization of private lives and public lives, as if two distinct kinds of water could be drawn from the same source.

As Statements 4 indicate, Warren and White are in agreement that for Christians, in particular, there should be no gaps between words and deeds. Good intentions or lofty rhetoric are insufficient, while assent unaccompanied by action is usually insincerity or worse—hypocrisy—for which, in spiritual matters, Jesus repeatedly reserved His strongest criticism.

Habits and Character

Another area of concurrence is the role of habits in character formation as indicated by Statements 5a and 5b. Habits are regarded as behavior patterns of thinking, acting, or feeling that have become established over time, through frequent repetition.

Warren and White's references to the nexus between habits and character assumes a *moral* context. This precludes mannerism and routines such as sniffing and nail-biting or brushing one's teeth after meals and making a daily to-do list, among others. Rather,

for example, it has to do with habitual dishonesty, arrogance, abusive conduct, or malicious Twitter gossip, when these behaviors have become "second nature" to an individual. Jesus touches on this in teaching His disciples, "'For from the inside, from your heart, come the evil ideas which lead you to do immoral things, to rob, kill, commit adultery, be greedy, and do all sorts of evil things. . .'" (Mark 7:21, 22, GNT).[31] How is such a low point reached?

Character, according to the authors,

> The quality of our moral and spiritual choices has eternal consequences so clearly seen in Scripture; for instance, in the lives of Ruth, Absalom, Judas, Zacchaeus, the Samaritan woman, and the Philippian jailer.

is not established by a significant single act, but a multiplicity of minor actions and behaviors (see statements 5a). In turn, actions are prefixed by thought patterns which lead to distinctive behaviors; hence the apostle Paul's counsel to the believers at Philippi to think on the things that are true, honest, just, pure, lovely, and respected because, as Proverbs 23:7 (KJV) frames it, "as he [man] thinketh in his heart, so is he."

Character is an edifice that is perceived as being built "brick by brick," resulting eventually in virtue or vice; good or evil. Moreover, the building venture is intentional, rather than for-

tuitous; it takes time, practice, and repetition, before it becomes permanent and part of our real self.

A Determinant of Character

"Character development always involves choice," declares Warren,[32] which is foreshadowed by White's statement, "Without freedom of choice . . . . There could have been no development of character"[33] (Table 1, 6). The Genesis 2:16, 17 statement, "'You may freely eat the fruit of every tree in the garden—except the tree of the knowledge of good and evil'" (NLT), plainly illustrates that freedom of choice within clear boundaries (*vis-à-vis* "programmed" behavior) has been the immemorial privilege of human beings. Thus, neither writer subscribes to predestination, but each upholds humanity's free will to respond to God's unmerited offer of salvation.

In making choices, we weigh up alternatives. The quality of our moral and spiritual choices has eternal consequences so clearly seen in Scripture; for instance, in the lives of Ruth, Absalom, Judas, Zacchaeus, the Samaritan woman, and the Philippian jailer. Furthermore, as mentioned above, when our repeated moral choices become habitual, when weighing up alternatives no longer becomes necessary, they form part of our character; of who we are.

However, when it comes to decisions, Christians should not become self-reliant; there is no place for hubris. Believers are challenged to claim Jesus' promise, "'I will not leave you orphaned. . . . I will love him [you] and will make myself plain to him [you]'" (John 14:18, 21, *The Message*)[34]; the promise applying not merely to spiritual matters but also our everyday life, guided by the Spirit. Hence, one is always able to avail oneself of God's guidance in perplexing situations. Divine Providence, through the Spirit, may use various means to direct us, including clarity of thought, verses of Scripture, trusted friends, pastoral counsel, or professional help, in dealing with whatever circumstances we may be faced with.

Character Development's Woes

Both White and Warren piggyback on the apostle Paul—who invokes the analogy of a foot race (1 Corinthians 9:25, Hebrews 12:1) and the associated necessary athletic training and self-discipline—to describe their view of character development. The apostle readily admits to his own struggles with character formation in his letter to the believers in Rome (Romans 7:15-19).

Together with Paul, our two authors (see Table 1, 7) perceive character development for the Christian as an enduring battle with self. In listing the fruit of the Spirit in Galatians 5:22, 23, it is instructive to note that the KJV's "temperance" is rendered as "self-control" in the NIV. Thus, character development is perceived not as "happening" to us. It is not a passive experience, but an active process in us; it is a dynamic involving choice, our will, and requiring decisions—including amidst trials, turmoil, and temptations—the context of, "I can do all things through Christ, because he gives me strength" (Philippians 4:13, NCV).[35] But believers may yet have to endure some fiery experiences in "the kiln of life" before the beauty of the finished artifact by the Divine Potter is realized.

It should be noted at this point that Warren and White look at character development from an angle of practical and foundational Christianity (as a Spirit-empowered faith endeavor, where Christ is the embodiment, *par excellence*, of good character) rather than looking at it through a theoretical, academic lens. The two authors focus on principles and essentials of good character for the edification of their audiences. Thus, they emphasize character development's eternal significance, the contribution of habits, making good and noble choices, exhibiting conduct that confirms exhortation, while acknowledging the day-to-day struggles inherent in this challenging human project.

Marshall, Caldwell, and Foster[36] hold to a much more complex and academic approach in their CHARACTERplus Way® education model. On a secular platform, it features a whole-school and community curriculum-integrated K-12 character-education program with specified elements, content, and pedagogical processes, adapted from several sources. If extended to its logical extremity, the ideal type of character development suggested by

> **Character, whether bad or good, does not come with our DNA at birth, but is developed. Additionally, good character is not easily or quickly attained, for it involves struggles to bring about changes in our human behavior that are not temporary, but which are stable and endure over time.**

this model would incorporate student growth towards idealized states of being, specifically:

• *self-actualization* (acting consistently according to an internalized belief system), a part of Maslow's[37] hierarchy of needs;

• *integrity* (an end-of-life stage reflection that fully accepts oneself), a feature of Erikson's[38] stages of psychosocial development;

• *universalizing faith* (i.e., individuals' personal systems of meaning) in Fowler's,[39] or similarly, an universal ethical principled orientation in Kohlberg's[40] stages of moral development;

• *characterization* (i.e., internalizing values and consistently acting on these), as in Krathwohl, Bloom, and Masia's affective domain, a section of their taxonomy of educational objectives.[41]

In comparison, Warren and White's "character projects" probably rate in the KISS (Keep It Simple, Samantha) category. Aimed at a different audience, the projects' comparative modesty, however, project a powerful biblical worldview about transformation of human behavior. Also, speaking prophetically (as in 1 Corinthians 14:3), i.e., forthtelling, and in a teaching-pastoral capacity, the authors are building up, encouraging, and comforting for the purpose of seeing changed lives patterned after Christ. Warren and White are thus clearly engaged in a faith-grace project, *vis-à-vis* secular initiative that is not biblical-virtues-focused and which aims to teach ethical conduct and behavior to develop good character, through a formal whole-school curriculum program.

Conclusions

In review, Warren and White, surprisingly, turn out to be fellow pilgrims. It is evident that they have a remarkably similar outlook on Christian character development, according to the tabled texts and the ground covered in this article. On the authors' part, there is particularized concurrence—rather than a display of differentiated, denominational viewpoints—despite their contrasting formal educational levels. Warren has a DMin from Fuller University, whereas White was self-educated, not having gone beyond an elementary education; yet they communicate a mutual message. This raises an interesting and important question: why the similarity in outlook?

Given Warren's background, history, and *modus operandi*, it is most unlikely (although not an impossibility) that he has read some of White's work or that he has a 19th-century

theological mindset. So, one should look elsewhere to explain the similarity.

Initially, one should focus on the part played by Scripture. It is extensively "mined" by both authors. Albeit there are no direct Bible quotes in Table 1, the influence of Scripture is keenly felt. Neither author specifically refers to their method of interpreting Scripture; their assumed approach being not unlike using the Wesleyan Quadrilateral—a variety of tools for theological reflection, namely, Scripture, tradition, experience, and reason. A progression of this approach is what today's theologians call the historical-grammatical method—a hermeneutic that takes various aspects into account, e.g., author's intention, language, context, culture etc., to arrive at a faithful interpretation of the text. Furthermore, Warren and White are writing about timeless principles articulated in holy writ. It is contended that accepting these constant principles, when coupled with a similar approach to interpreting Scripture text, would lead to shared viewpoints and additionally result in compound flow-on effects as considered below.

Second, faithfully interpreting the text of Scripture leads to an understanding of the importance of grace in the development of Christian character. It also inevitably points to the centrality of Christ in character development in the lives of Christian believers. We are not the "architects" of our own characters, as Warren and White believe and point out, notwithstanding a measure of self-determination, our personal input, and cooperation with Christ.

Importantly, no measure of character growth on our part should be conceived as meriting salvation; it is wholly a free gift! Hymnologists precis this viewpoint fittingly, "On Christ, the solid rock, I stand; All other ground is sinking sand."[42] Thus, in character formation, dependence on Christ is seen as paramount by Warren and White; both are entirely Christ-focused. The corollary of their mutual

belief in justification by faith in Christ alone, together with their attendant commitment to sanctification (as suggested by Statements 2 and 4), is a harmonized view of Christian practice and lifestyle, that extends to character development.

Third, it can be inferred from statements in Table 1 and as a flow-on from the authors' orientation to Scripture, that they hold to the understanding that human beings were created in the image of God—the *imago Dei* (Genesis 1:27). Human beings are per-

> **Human beings are perceived as having been created to be image bearers, having the immense potential to reflect God's divine nature in their moral, spiritual, relational, creative, and intellectual essence!**

ceived as having been created to be image bearers, having the immense potential to reflect God's divine nature in their moral, spiritual, relational, creative, and intellectual essence! The staggering implication and outcome of God's original act of creating humans becomes crystal clear in light of a recent statement regarding the human brain by the New Scientist Academy,[43] "Your head holds the most complex object in the known universe."

What is more, Warren's and White's perspective on character development, in essence differs from a secular viewpoint in that it not only has a distinct spiritual, moral, and eternal dimension but, even more important, it is a Christ- and Spirit-empowered endeavor rather than a solely

human self-constructed undertaking.

Fourth, another already noted shared feature is the effort and time taken to develop a Christ-like character. The latter is developed—like diamonds from carbon—under pressure! Not only can this be deduced from the lives of Jesus' original disciples but also their present-day counterparts. Warren and White identify with all believers who struggle with sanctification; our need and willingness to be made holy—set apart—by God, as a loving response to Jesus' saving sacrifice.

It is very likely that in their own Christian journey, both Warren and White have experienced deeply the reality of the adage, "God comforts the afflicted and afflicts the comfortable"; leading them, again, to shared insights—the upshot of similar experiences.

Having put forward some reasons that underpin Warren and White's surprising shared perspective on Christian character development, one might safely conclude that they would also jointly declare with the apostle Paul, "I am certain that God, who began the good work in you, will continue his work until it is finally finished on the day when Christ Jesus returns" (Philippians 1:6, NLT).

Finally, what is the key takeaway message? God is the source of gifting the ministry of teaching (1 Corinthians 12:28). Teachers (and parents) of students in Christian faith-based schools have been placed in a privileged and challenging position of responsibility of being co-workers with Christ. In performing their many teaching tasks and duties, teachers, over time, play a critical role in shaping students' learning and character development. Through modeling of an authentic Christian lifestyle, teachers also bear witness to the power of the gospel and the agency of the Holy Spirit in character formation.

As respective leaders in their faith communities, Rick Warren and Ellen White, in writing about aspects of character development, have offered

teachers, as well as educators and parents, some valuable insights about a "project" that ultimately has eternal consequences. ✏

This article has been slightly adapted with permission of TEACH, where it was originally published as "Rick Warren and Ellen G. White on Christian Character Development: An Unexpected Meeting of the Minds?" *TEACH Journal of Christian Education* 16:1 (2022): 52-59. 10.55254/1835-1492.1510.

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20. Bible references in this article credited to NLT are quoted from the *Holy Bible, New Living Translation,* copyright © 1996, 2004, 2015 by Tyndale House Foundation. Used by permission of Tyndale House Publishers, Inc., Carol Stream, Illinois 60188. All rights reserved. Italics supplied.

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Siroj Sorajjakool

Academia, the Sabbath, and the Fourth Industrial Revolution

Note: *This article is slightly adapted from a presentation at the Seventh International Scholars Conference (7ISC) in Bandung, Indonesia, in October 2019. The conference was organized by Universitas Advent Indonesia [Indonesian Adventist University] (UNAI), Universitas Klabat [Klabat Adventist University] (Unklab), Adventist University of the Philippines (AUP), and Asia-Pacific International University (AIU) under the theme "Knowledge Creation In 4.0 Industrial Age." Taking place pre-COVID-19 and OpenAI's release of ChatGPT, the perspective shared reminds Adventist educators of the central purpose of Adventist education amidst changing economic, philosophical, social, and political tides.*

A preliminary exploration of the implications of the theology of the Sabbath in the rapidly changing world impacted by the Fourth Industrial Revolution is essential for Adventist education in Southeast Asia. This region, like many parts of the world, has gone through a significant philosophical, cultural, linguistic, economic, and political transformation during the colonial era of the 19th century and its subsequent development. Major changes initiated during this period have left deep imprints in our collective psyche. The worldview of the industrial world has transformed our everyday lives via our educational system.

As we look forward to the world of digital revolution, the world that moves at unprecedented speed, the theology of the Sabbath invites us to pause and reflect on what it means to be human, created in God's image, in the world where our identity and values are measured through numeric quantification. How can we, as Christian educators, resist the dominant discourse that sees humans as *homo economicus* [economic person]? How can we assist those within our demographics with knowledge and skills to live through these rapidly changing times rooted in digital cosmology so that we can live meaningfully, realigning humanity with the image of God in this new Industrial Age?

Questions

The biblical narrative in Genesis 1 describes God's magnificent creation from the void to the beautiful ecological system with humans as guardians of the earth. Genesis 1:31 says: "Then God saw everything that He had made, and indeed *it was* very good" (NKJV).[1] In Genesis 2, God rested and beheld the beauty of His creation. In my mind's eye, I imagine this scenario: After a few thousand years passed and while beholding His creation, God exclaimed: "Who stole My cloud?" I imagine the angels replied, "Google did."

"And how come people are not talking to one another?" God asked. And the angels replied: "They text and chat through Facebook and Line[2] and WhatsApp, Lord."

"And why is it that humans no longer till the land for food and nourishment?" The angels replied, "Jeff Bezos of Amazon.com uses drones for delivery, or they call Grab Food instead, Lord."

And, I imagine God could no longer rest on the Sab-

bath, grieving the loss of His creation because humans are now living not in created reality but in virtual reality. They are no longer in touch with God's creation. The scenario might seem light and humorous; however, it speaks to the times we find ourselves living in Asia and many other parts of the world.

The Initial Impact of the Industrial Revolution

On April 18–25, 1955, the first large-scale Asian-African Conference was held in Bandung, Indonesia.[3] The delegates to the conference represented 54 percent of the world's population. The question they were addressing was how to find a post-colonial method to move forward as nations. However, the Thai delegate to the Bandung Conference, Prince Wan, under the leadership of Prime Minister Pibul Songgram, had a different concern: national security.[4]

Caught within the geopolitics of two political ideologies post-World War II, Thailand was designated a buffer country by the United States to prevent the speculated domino effect as Communism spread across Southeast Asia. Industrial development was the preventive strategy. In the early 1960s, Field Marshall Sarit Thanarat (a Thai general) welcomed a massive amount of monetary foreign aid, knowledge, policies, and other scientific interventions in the name of national and regional security.

The vast geographical landscape and its people were transformed. However, the impressive increase in gross domestic product (GDP) cannot account for significant changes in the lives of the vast majority—from subsistence living to monetary dependency. In his book *The Growth Delusion*, David Pilling writes:

"Economic growth has become a fetish, a proxy for everything we are supposed to care about and an altar on which we are prepared to sacrifice all. In pursuit of growth, we are told, we may have to work longer hours, slash public services, accept greater inequality, give up our privacy, and let 'wealth-creating' bankers have free rein."[5] Pilling continues, "Only in economics is endless expansion seen as a virtue. In biology it is called cancer."[6]

Historically, the people tilled the soil and produced food for nourishment. Development stepped in and said, "You did it all wrong." Polyculture must be replaced by monoculture.[7] Instead of producing crops for consumption, you need to produce food in massive amounts through our scientifically proven fertilizer, our superior pesticides, and our genetically modified seeds. Sell them in exchange for money and buy food. The people said, but we already have food from our labor. The dominant discourse responded with imperative disapproval. You must produce food and sell your food so that you can buy your food. And the policies were put in place to support the industrialization of the nation. Soon, we were a part of the Asian Economic Tigers. But the people lost their land with incurred debt. Massive migration occurred among young men and women, leaving children and older adults in rural villages. Families started falling apart in the name of progress and modernization. People flocked toward money to survive, resulting in over-saturated urbanization.[8] For example, in 2017, the accumulated farmers' debt stood at 2.8 trillion baht.[9]

Our educational curriculum is designed for an industrial world under the domination of scientific cosmology and technology. Jon Jandai, a Thai advocate for an agrarian lifestyle, once said, "When I saw a child walking into a school, I saw that child entering a factory."[10] Our educational system is not designed for sustainable agrarian living. David Pilling 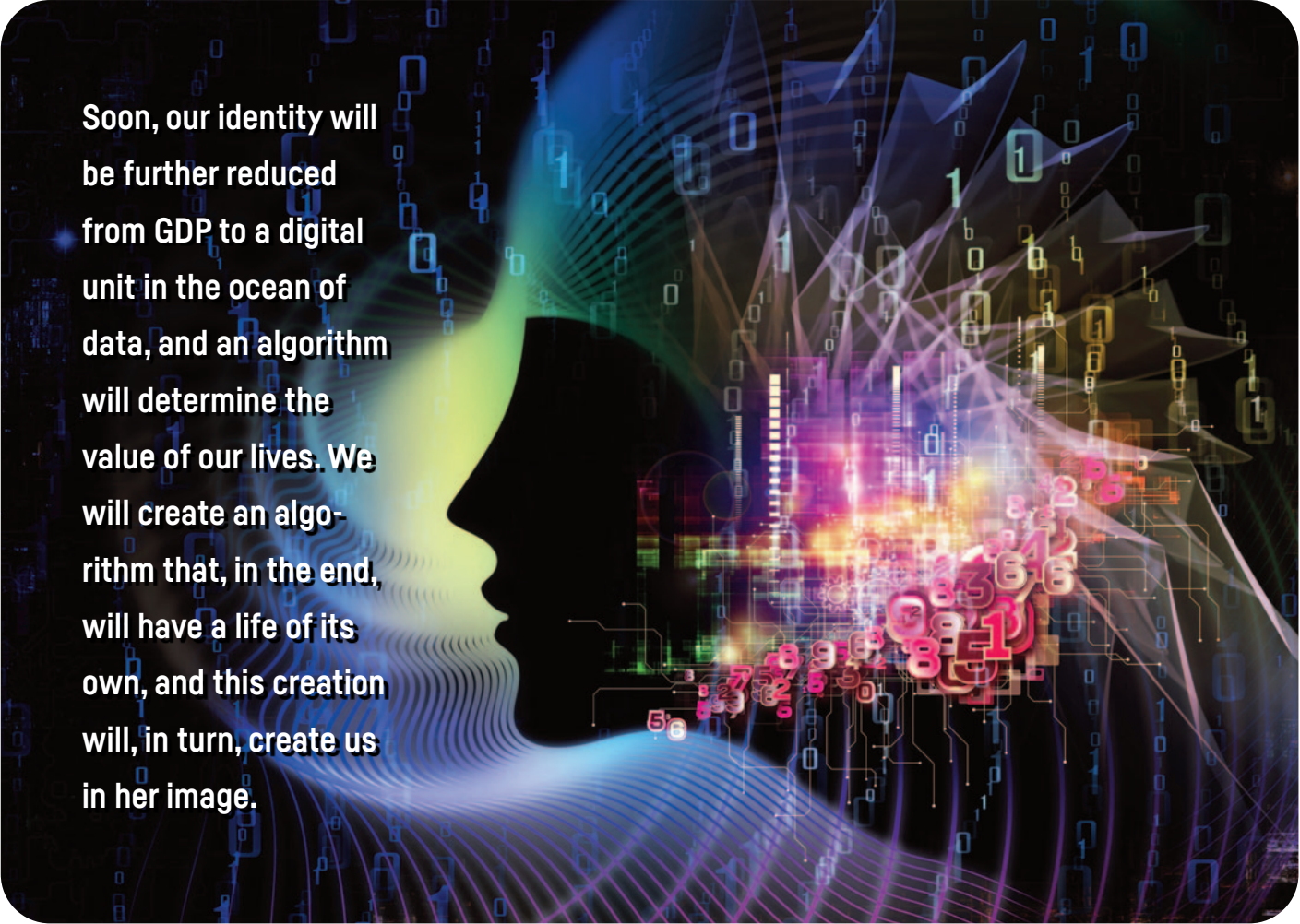noted that for thousands of years, there was no push for high yield and high productivity from within the agriculture economies. The Industrial Revolution changed everything.[11]

> We know that big data will direct the market, and Big Brother is watching our every step, tracking the movements that we have left through our digital footprint.

The Impact of the Fourth Industrial Revolution

But that was our history, as the people on the margin have negotiated the industrial revolution in Thailand since the early 1960s. What will the Fourth Industrial Revolution bring?

We know the world is changing very rapidly. But how it will transpire in the future world is left to speculation. We know that big data will direct the market, and Big Brother is watching our every step, tracking the movements that we have left through our digital footprint. We know artificial intelligence (AI) will replace various forms of labor, and knowledge will be

Soon, our identity will be further reduced from GDP to a digital unit in the ocean of data, and an algorithm will determine the value of our lives. We will create an algorithm that, in the end, will have a life of its own, and this creation will, in turn, create us in her image.

made readily available through technology. We also know that because GDP has come to define success, education has been forced to serve the labor market for her existence. It comes down to food on the table, but the route is via convoluted virtual reality that we must navigate.

Soon, our identity will be further reduced from GDP to a digital unit in the ocean of data, and an algorithm will determine the value of our lives. We will create an algorithm that, in the end, will have a life of its own, and this creation will, in turn, create us in her image.[12] Yuval Harari projected that in the future, we will even ask algorithms who we should marry: John or Paul? And Google will respond: "'Well, I know you from the day you were born. I have read all your e-mails, recorded all your phone calls, and know your favorite films, your DNA, and the entire biometric history of your heart. I have exact data about each date you went on, and I can show you second-by-second graphs of your heart rate, blood pressure, and sugar levels whenever you went on a date with John or Paul. And, naturally enough, I know them as well as I know you. Based on all this information, on my superb algorithms, and on decades' worth of statistics about millions of relationships—I advise you to go with John, with an 87 percent probability of being more satisfied with him in the long run.'"[13]

Concluding his book *Homo Deus*, Harari asks, "What is more valuable, intelligence or consciousness? What will happen to society, politics, and daily life when non-conscious but highly intelligent algorithms know us better than we know ourselves?"[14]

The answer is in the famous Socratic quote, "Know thyself." Harari argues: "In the end, it's a simple empirical question. As long as you have greater insight and self-knowledge than the algorithms, your choices will still be superior and you will keep at least some authority in your hands. If the algorithms nevertheless seem poised to take over, it is mainly because most human beings hardly know themselves at all."[15]

The Sabbath and Seventh-day Adventist Educational System

We all remember Mr. Anderson (Neo) in *The Matrix* because of his bullet-dodging skills like no other. But that was because he had the code that enabled him to see the Matrix. While Neo had the red pill and a heavily wired machine to help him uncode the Matrix, we have the Sabbath. As Seventh-day Adventist educational institutions, while we prepare students to be competent for the future world of technology, we return again and again to God's creation. We return every week. Weekly, we are reminded of our creatureliness, our finiteness. Weekly, we are reminded of the created reality versus virtual reality. Weekly, we are reminded repeatedly of the difference between virtual reality and created reality and the values implied in both systems.

While the advancement of technology in the world of dataism[16] and algorithms defines our value through production and contributions to GDP, the Sabbath reminds us that our worthiness depends on the fact that we are God's handiwork. I believe this is a vital role for us as Adventist educational institutions. While we prepare students to be competent in the coming technologically advanced reality, we offer another reality with a fresh set of values and a value system rested in the uniqueness of our individual selves as God's creatures. And in our everyday interactions, we keep reminding others that they are not a unit of measurement but a created reality in God's hand. In the world of dataism, we assert individualism. In the world of algorithms, we assert creationism. We become the new Kierkegardian theological revolution in the world of modern Hegelian absolutism. This becomes the emerging role of Adventist education—the dispensing of knowledge through incarnated interactions that remind others of the true measure of the self. The Sabbath helps us see through the Matrix. Through this lens, we resist treating students as numbers, but we keep validating them through the eyes of God. The Sabbath, as a constant reminder of Creation, is also a symbol of resistance toward the dominant discourse. Walter Brueggeman, in *Sabbath as Resistance*, wrote: "In our own contemporary context of the rat race of anxiety, the celebration of Sabbath is an act of both resistance and alternative. It is resistance because it is a visible insistence that our lives are not defined by the production and consumption of commodity goods."[17]

And through the Sabbath, we rediscover the cloud, and human relationship, and we till the land for sustainability while writing algorithms and analyzing data so as to be that light in the world of virtual reality. ✑

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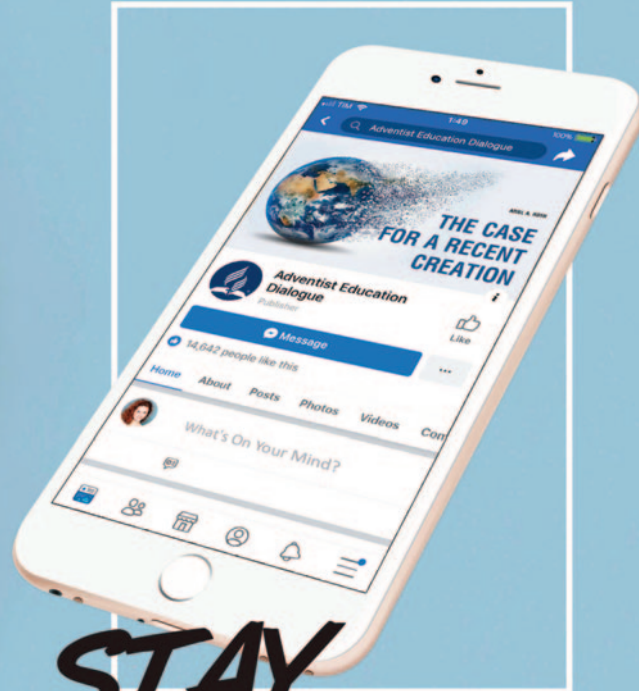
last decade while other nations' farmers adopted modern technology, techniques, and developed improved, local and independent marketing models to improve their lives, Thailand's farmers remained mired in hopeless dependence on antiquated and ultimately failing practices."

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Emeraude Victorin Tobias

THE GEOSCIENCE RESEARCH INSTITUTE:

A Resource for Teaching a Biblical Understanding of Earth History
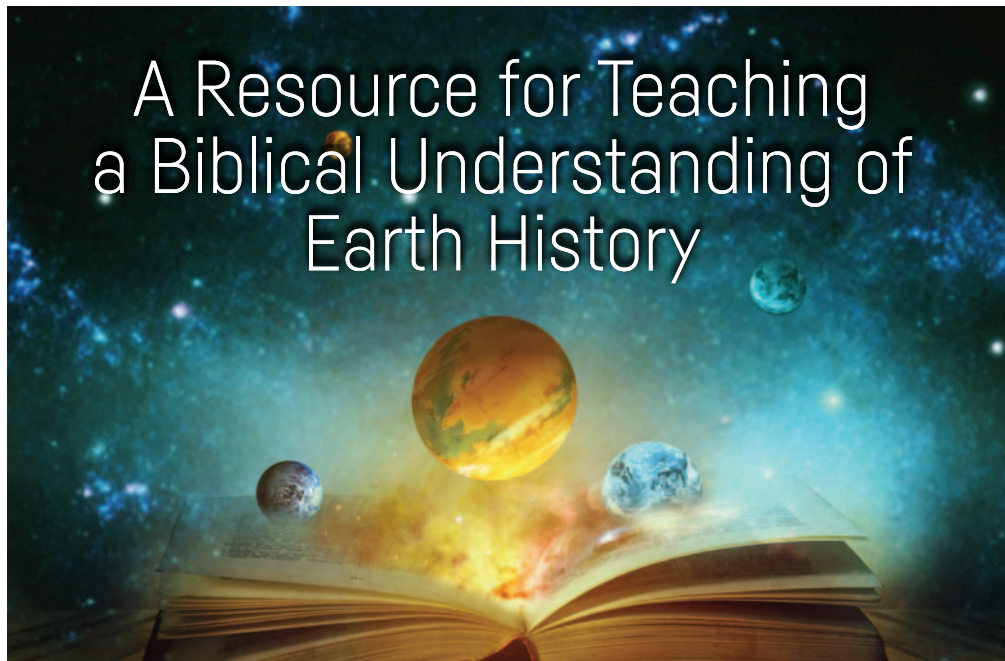
Just before the North American Division Educators Convention in Phoenix, Arizona, U.S.A., on August 7–10, 2023, more than 40 passionate North American Division (NAD) science teachers embarked on a journey with Geoscience Research Institute (GRI) scientists to explore the magnificent landscapes of the Petrified Forest National Park, the Grand Canyon, Sunset Crater Volcano National Monument, and more.[1] The goal of the field trip was to offer participants a firsthand experience that enhanced their appreciation and comprehension of geology and the history of the Earth. Led by GRI Director Ronny Nalin (PhD in Earth Sciences), and GRI scientists Ben Clausen (MS in Geology, PhD in Physics), Tim Standish (PhD in Environmental Biology and Public Policy), and Raúl Esperante (PhD in Paleontology), the goal of this tour experience was to help prepare teachers to integrate faith and science effectively in their classrooms.

At the Petrified Forest National Park in northeastern Arizona, teachers observed and were fascinated by the remains of trees that had turned to stone, revealing the wonders of natural transformation. Here, they discussed the process of fossilization, how long it takes for wood to petrify, and how fossils paint a picture of past animal interactions and their environment. Walking amongst these fossilized tree logs provided an opportunity to discuss processes and sediment transport rates.

The trip through the breathtaking Grand Canyon in northern Arizona and Sunset Crater Volcano National Monument north of Flagstaff, Arizona, offered a remarkable setting for discussions surrounding the origins debate and the geologic record. As they gazed into the vast chasm, the educators could not help but be humbled by the scale and complexity of the Earth's geological history. They were presented with the unique opportunity to study the intricate rock formations that could be viewed through the lens of catastrophism or gradualism. They also observed footprints and other fossils embed-

ded in the rock while hiking down into the canyon on the South Kaibab Trail.

"As an instructor of grades 1–8," said Rachel Jameson, teacher at Edenville Seventh-day Adventist Elementary School (Michigan, U.S.A.), "I will make a greater effort to give my students field experience in the sciences and to teach them that although we may not be able to explain all the evidence we find, we can still trust what God says in His Word."[2]

After experiencing the wonders of nature and absorbing the information presented, the educators engaged in in-depth discussions and workshops by Drs. Nalin, Clausen, Standish, and Esperante. Together, the presenters and educators explored ways to effectively blend faith and science in classroom instruction and were reminded to respect science while remaining faithful to God and the Bible.

"As a science teacher," said Joel Shetler, incoming science instructor at Spencerville Academy (Maryland, U.S.A.), "I wear two beautiful hats, one as a scientist, where I want to present evidence and help students learn how to research and determine what to do with that evidence, but also as a teacher in the Adventist community, where I bring in the faith side of it. I show how the evidence relates to our beliefs but that ultimately, we must keep learning and researching."

Armed with fresh perspectives and a commitment to nurturing their students' spiritual and scientific growth, the participants left with a renewed desire to ignite a transformative spark in the education community. They are prepared to enrich the lives of their students by fostering a deeper appreciation for the natural world and its Creator. With the lessons learned from this adventure, these educators are poised to guide the next generation on a path of wholistic understanding, where faith and science complement each other in the quest for growth in knowledge and wisdom.

The mission of the Geoscience Research Institute of the General Conference of Seventh-day Adventists is to seek, develop, and share knowledge with the global church. Established in 1958, the Institute sought to fulfill a specific, unique purpose: "to explore the natural world, seeking to develop and share an understating of nature consistent with the biblical teaching as expressed in the Church's statement of fundamental belief on creation." To this end, GRI scientists work to address questions and seek evidence concerning origins within the context of revelation and biblical foundations. Through conducting research and then communicating results, the GRI provides a valued service and is a critical resource for Adventist educators teaching and studying sciences: biology, ecology and conservation, intelligent design, geology, paleontology, cosmology, faith and science, and other sciences.[3]

GRI provides several resources to help educators guide students as they explore the natural world. These resources can be used to plan and supplement lessons for various natural science subjects. For more information on GRI resources, please visit their website at http://www.grisda.org and subscribe to their newsletter. ✎

> ## GRI Resources Available to Educators
>
> The following resources are available for educators and can be found on the GRI website:
>
> **Books**: https://www.grisda.org/books
>
> **Articles:** https://www.grisda.org/articles
>
> **Posters:** https://www.grisda.org/posters
>
> **Website collection:** https://www.grisda.org/top-ten-websites
>
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1. Versions of this article have been published in several Adventist resources online. Adapted for use in *The Journal of Adventist Education*®(JAE).

2. Names of educators quoted have been used with permission.

3. GRI began in 1958 on the campus of Andrews University. The Institute was called the "Committee on Teaching Paleontology and Geology." In 1962, it became the Geoscience Research Institute, and in 1980, it moved to Loma Linda University (Loma Linda, California, U.S.A.), where it currently resides. For more, see Ariel A. Roth and L. James Gibson, "Geoscience Research Institute," *ESDA* (2022): https://encyclopedia.adventist.org/article?id = 8JFT.

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Andrea Gray

Best Practice Approaches for

M ultigrade educators have to use different approaches and structures to facilitate teaching and learning, as contrasted with the teachers of single grades. As novice and seasoned multigrade teachers navigate the processes related to instruction in a multigrade environment, they must understand and appreciate that this approach to learning is unique. Effective implementation of best practice approaches requires practice. With careful mentoring, educators will learn how to adapt these approaches effectively to various learning environments and to best meet students' needs.

A Brief History

Multigrade education, or the practice of combining learners from different grade levels in one learning environment, has been a part of the education system in Canada and the United States for a long time. In fact, for many years, it was the norm in rural areas due to small class sizes and limited resources. The earliest record of multigrade education in both countries dates back to the 1800s when one-room schoolhouses were common in rural areas. Teachers would often have to provide instruction to learners from various grades at once due to limited resources and funding. As education became more centralized and urbanized in the early 1900s, a number of rural schools were forced to adopt a multigrade model due to declining enrollment and limited resources. With the introduction of standardized curriculum and grade levels in the mid-20th century, and an increase in the number of school-aged children due to the post-World War II population increase, there was a move toward single-grade classrooms, which were seen as more efficient for delivering standardized content.[1]

In the 1970s and 1980s, there was a renewed interest in multigrade education as educators recognized the benefits it provided for children. By the 1990s, multigrade education was once again accepted as a viable option for rural schools, and several provinces and states developed policies and guidelines related to its implementation. In Canada, one source shared that during this period, one in seven schools in Canada was multigrade.[2]

Multigrade Education and Adventism

The concept of multigrade education is not unique to Adventism; it is a prominent feature of public schools across the United States and Canada, as well as other countries. In 2022-2023, 60 percent of Adventist schools in the North American Division were small, multigrade schools.[3] This system of classroom organization enables Adventist schools to maximize limited resources and offer a Christian education to children who might not otherwise have access to one.

Whether deliberate or out of necessity, urban or rural, multigrade learning environments continue to provide learners with quality education opportunities that promote social and emotional learning, foster collaboration and peer mentoring among learners of different ages, and provide a more personalized and flexible approach to learning.[4]

The Multigrade Learning Environment

Every multigrade learning environment will look different, depending on its context, just as every single-grade classroom is unique. In a multigrade learning environment, children of varying grade levels and developmental levels learn alongside one another. These rich environments are unique to one-, two-, or three-teacher schools. Learners share didactic experiences from each of the grade levels present while actively participating in their learning experience. Children develop autonomous learning strategies through self-directed learning opportunities while contributing to and sharing in whole-group learning activities. In the multigrade learning environment, it is common practice to see different groups of children engaging in a variety of learning activities at the same time. Ultimately, in this type of learning environment, the learner-teacher relationship is fundamental to the process, and the teacher shifts to the role of manager and facilitator of learning rather than dispenser of knowledge. Described as a "family-like"[5] atmosphere by stakeholders, the multigrade learning experience pays tribute to the nostalgic learning spaces of yesteryear while progressively retaining relevance today.

Prioritizing a Multigrade Pedagogical Approach

For both the new multigrade teacher and the sea-soned teacher, teaching several grade levels simultaneously requires a lot of time and preparation, organization, creativity, patience, access to resources, and relevant learning ecosystem management. Multigrade teachers often find themselves shedding most of their learned single-grade pedagogical practices because they simply do not fit.[6] The beauty and challenge of a multigrade pedagogy is that it borrows most of its pedagogical practices from multiage pedagogy and, when relevant, uses single-grade pedagogy, then applies these practices contextually.[7]

A multigrade education philosophy should focus on the individual needs of each child, recognizing that children have different learning styles and abilities. Adopting learner-centric teaching and learning strategies increases the success and sustainability of multigrade education.[8] Children, throughout their multigrade learning experience, develop autonomy skills because the teacher cannot teach all the grade levels at once.[9] Through this skill development, children build initiative and learn to take ownership and responsibility for their learning. Learners receive individualized attention in this learning environment, however, differently from traditionally perceived one-on-one time. Teachers in multigrade environments use differentiated instruction, small-group work, and other methods to provide individualized attention to each child. They also work collaboratively with their learners, fostering a sense of community and learning through group work and peer-to-peer interactions.

When teaching in a multigrade learning environment, developing a pedagogy that informs a multigrade teacher's practice allows for greater awareness of essential theories and methodologies that best sustain learning and learner success.

Overview of Quality Teaching Practices

Effective multigrade teaching practices are not only effective in the multigrade classroom but also are successful in the single-grade classroom; however, the reverse may not always be applicable. Contextual evidence-based teaching practices enhance the sustainability of the multigrade learning environment and enhance the quality of education for all children.[10] Below are some time- and re-

> Described as a "family-like" atmosphere by stakeholders, the multigrade learning experience pays tribute to the nostalgic learning spaces of yesteryear while progressively retaining relevance today.

search-proven effective teaching practices:

1. Whole-class Teaching: Some lessons can be taught at the same time. When applicable, whole-classroom instruction is an efficient strategy by which the teacher can facilitate learning and teaching using one lesson instead of creating several different mini-lessons and workshops for each grade level. In whole-class teaching, the learning activities may be the same, yet the expectations of learners and assessments differ.[11]

2. Curriculum Rotation: Curriculum rotation partly simulates split-grade/single-grade learning in a multigrade learning environment. This practice involves teachers alternating/rotating certain subject curricula and learning standards. This is not always possible in sequential subjects where concepts build on one another, like mathematics, or in grade levels where standardized tests are mandated.[12]

3. Peel-off Strategy: In this instructional method, teachers plan and deliver lessons that are suitable for different ages and learning levels within a single classroom. The strategies aim to "peel off" the lessons from the centralized teaching materials and differentiate them for different learners' readiness levels to ensure that each one can achieve his or her full potential. This provides opportunities for effective individualized and cooperative learning, maximizing the benefits of multigrade classrooms while also addressing individual learners' needs.[13]

4. Staggered Starts: Decreasing wait time minimizes "learning loss" as students wait for learning instructions from their teacher. Teachers often will stagger the start of subjects and learning activities when different levels of teacher-learner attention are required.[14]

5. Differentiated Activities: Differentiated learning is a crucial component of multigrade education. It helps to ensure that all students are challenged and engaged in the learning process. By using flexible grouping, choice boards (see p. 43), personalized learning plans, project-based learning, and technology integration, teachers can create a dynamic and inclusive learning environment for their students. Providing activities for remediation or extension allows the teacher to gauge a child's level of learning. Activities can be differentiated by varying levels of complexity for several reasons, including the learning outcome, learning process, or complexity of the learning product.[15]

6. Peer Tutoring: Children from different grade levels are paired together to learn from each other. This method involves assigning older or more experienced learners to assist younger or less-experienced learners in their studies. It requires the use of cooperative learning techniques that create an environment of trust among learners of different levels. The main goal of peer tutoring is to encourage collaboration, communication, and critical-thinking skills among learners while improving their academic performance.[16]

> The main goal of peer tutoring is to encourage collaboration, communication, and critical-thinking skills among learners while improving their academic performance.

7. Cooperative and Collaborative Learning: Authentic cooperative learning opportunities involve children working together in small groups to accomplish a shared goal or learning objective. Consider these five principles for successful cooperative and collaborative learning opportunities:[17]

a. *Positive interdependence:* All members of the group need to feel that they are working together for a common goal and that the success of the group as a whole depends on each individual.

b. *Individual accountability:* Each member of the group must be held accountable for his or her individual contribution to the group's success.

c. *Face-to-face interaction:* Cooperative learning requires that students have face-to-face interaction to effectively communicate and collaborate with their group members.

d. *Social skills:* Students must develop social skills such as communication, active listening, and conflict resolution to work effectively in a group.

e. *Group processing:* The group should regularly reflect on their progress, identify strengths and weaknesses, and make adjustments as needed to improve their performance.

These five principles, when used in a multigrade classroom, provide opportunities for teachers to differentiate instruction and for learners to develop life skills and the ability to innovate, while encouraging communication and collaboration skills with others in the classroom.[18]

8. Open-ended Questioning: Open-ended questioning typically begins with words like *how, what,* and *why,* and encourages discussion, exploration, and creativity. The goal of asking open-ended questions is to encourage the person being questioned to provide thoughtful and complex answers that express his or her depth of knowledge and experience.[19]

9. Independent Learning Routines: Independent learning routines are activities and tasks provided by teachers to help children work independently and take responsibility for their own learning. These routines provide opportunities for learners to develop self-discipline, problem-solving skills, and critical-thinking abilities. Some examples of multigrade education independent learning routines include:

Learning Centers: Teachers create designated areas in the classroom where children can work independently on various learning activities.

Project-Based Learning: Not to be confused with *doing* a project, project-based teaching is an instructional approach that uses real-world projects as the basis for learning. Rather than teaching discrete skills or concepts in isolation, project-based teaching provides children with opportunities to apply their knowledge and skills to authentic problems or challenges. Learners work collaboratively to create products of their learning, solve problems, or complete tasks that have real-world relevance. Project-based teaching emphasizes learners-centered learning, allowing learners to take ownership of their learning and work at their own pace. Teachers act as facilitators or coaches, providing guidance and support as needed rather than lecturing or directing every step of the way.[20]

Choice Boards: Teachers provide learners with a list of learning activities from which they can choose based on their interests, learning style, and needs. Choice boards can be adapted to meet the needs of students of different ages and abilities and can be used across a variety of subjects and topics. By offering a range of activities, choice boards provide learners with opportunities to work at their own pace and level while still engaging with the same content or topic as their peers. Additionally, choice boards can be designed to foster collaboration and peer teaching, as learners may choose to work on the same activity or project as a peer or work on different activities and then share their learning with others.[21]

Task Cards: Teachers create sets of cards that contain independent learning tasks that children can complete on their own.

Inquiry-based Learning: Learners pose questions and investigate answers through research, experiments, and discussions.

Multigrade Assessment Practices

Multigrade education assessment practices involve identifying and addressing the diverse learning needs of learners from different grade levels in one classroom. Teachers use a variety of methods to measure student progress and learning and use this information to adapt instruction to meet individual learners' needs. In all classrooms, assessment for learning should reflect what learners are able to do.[22]

Some commonly used assessment practices include:

Learning Readiness and Diagnostic Assessments: These assessments help identify the strengths and weaknesses of individual learners in different subjects. The teacher can plan targeted interventions and instruction for each child. Learner readiness assessment can help students set realistic goals and develop a plan for achieving academic success.

Formative assessments: These ongoing checks throughout the learning process help teachers monitor each child's progress and gather evidence about his or her learning in order to modify teaching strategies to better meet individual needs.

Summative assessments: These are usually given at the end of a unit, term, or year to evaluate learning performance. They help measure the knowledge and skills learners have acquired throughout the term and give the teacher valuable insights into their pedagogical effectiveness.

Portfolio-type assessments: Collecting samples of a learner's work in different subjects over a period of time provides targeted exemplars of each child's growth and success. They help the teacher evaluate progress over time and provide learners with opportunities to reflect on their own learning. Coupled with student-led conferences, portfolio-type assessments allow learners to interpret their work to their guardians in a way that clearly articulates and illustrates their performance, process, and product.[23]

Peer and self-assessment: Learners evaluate their in-

> Rather than teaching discrete skills or concepts in isolation, project-based teaching provides children with opportunities to apply their knowledge and skills to authentic problems or challenges.

dependent work and the work of their peers. This helps children better understand the evaluation process and encourages collaboration and a greater sense of responsibility for their own learning.

Informal assessments: These assessments include observations, interviews, and conversations with learners. Teachers gather information on learner behavior, attitudes, and social-emotional needs, which can be used to personalize instruction.

In multigrade education, teachers often use a combination of these assessment practices to get a comprehensive picture of each learner's knowledge and skills. By adapting assessments to meet the unique needs of a multigrade learning environment, teachers can provide targeted and effective instruction to all their learners. Assessment for learning empowers students to take ownership of their own learning by helping them to understand their strengths and weaknesses, set learning goals, and develop a growth mindset. Assessment for learning supports young people in their journey toward becoming self-regulated, lifelong learners.

Conclusion

A multigrade classroom offers a diverse learning environment where learners of different ages and abilities work together. This creates an opportunity for socialization and helps learners develop a sense of empathy and understanding toward others. Teachers can personalize learning activities based on the abilities and strengths of each child. Since there is a wider range of abilities than in single-grade classrooms, teachers can differentiate instruction to build upon what children already know and help them grow in areas where they need more support. Teachers have the flexibility to adjust the pace of learning based on the needs of individual learners or the class. This can help teachers accommodate different learning styles and needs and ensure that students are able to be successful in their learning journeys. By bringing together children of different ages and backgrounds, a multigrade learning environment can help build a sense of community and foster a supportive learning environment. Children learn from one another and develop a sense of responsibility and leadership, which can benefit them beyond the classroom. ✐

This article has been peer reviewed.

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Bianca Loss

**Ophelia M. Barizo,
Seeing GOD Through STEM**

*S*eeing GOD Through STEM is a collection of short devotionals written by Ophelia M. Barizo, a retired science educator and consultant. Nationally certified in all areas of STEM (Science, Technology, Engineering, and Mathematics) through the National Institute of STEM Education (NISE), Barizo has served as STEM coordinator for the Chesapeake Conference of Seventh-day Adventists in Columbia, Maryland, U.S.A., and in several other roles. In addition to being the recipient of numerous awards, she also served as an Albert Einstein Distinguished Educator Fellow at the National Science Foundation (NSF) headquartered in Alexandria, Virginia, U.S.A. This collection of 35 devotionals interweaves lessons from the STEM fields with messages about God and lessons we can learn about Him. Students and educators alike will find their faith strengthened through these short and compelling readings.

The 35 devotionals follow a similar pattern throughout the book. Each has an attention-grabbing title like "Biobullies: Alien Invaders" and "Mind Controlled Prosthetics." Next is a Bible verse, which outlines and sets the tone for the entry. The verse is followed by the devotional. Devotionals include personal stories, historical events, scientific facts, and biblical stories. This initial story flows seamlessly into a religious message and ends with Barizo's main takeaway. The devotionals conclude with a prayer connected to the main topic. Each devotional includes at least one picture and is under three pages.

Barizo explains her goal in the preface: The devotionals will integrate faith and learning with the goal that they will draw students closer to their Creator. I felt my faith strengthened, and I believe that students and teachers will find themselves similarly affected. Barizo is incredibly successful in her connections between science and religion. Too often, people believe that science and religion are different sides of a battle, whereas, in reality, science points to the existence and love of God. Barizo's smooth transitions and choice of lessons from science will open the eyes of students and reveal new wonders about the Creator.

Seeing GOD Through STEM is most successful when the author tells personal stories.

Barizo pairs her personal stories with personal pictures. They connect with the story and offer a deeper understanding of the message. An excellent example is the devotional "The Wondrous Proton." Here, Barizo tells the story of her battle with sarcoma cancer and explains the scientific procedures that helped eradicate her cancer. The devotional is accompanied by a picture of Barizo at her treatment, which leads to the concluding point of the power of God's healing. The author is an excellent storyteller, and at times, you feel you are seeing her inner thoughts or reading her diary. The personal connection elevates this book above like devotionals.

I recommend this book to educators across all our elementary, middle, and high schools.

Elementary school teachers will find this book to be an excellent opening devotional for a science or religion class. The devotionals are short enough to retain a stu-

dent's attention span, while also being long enough to teach a lesson. With the older grades, students could even be asked to read the prayer, in order to promote student involvement and personal connections. For middle and high school students, this book is also excellent for devotionals and a good book to recommend to students to read on their own time. The devotionals encourage students to pursue STEM, which is an important tool at a time when students may struggle with self-esteem in different subjects and start to brainstorm future career choices. This book will be valuable in any of our Seventh-day Adventist classrooms.

Educators will also find that this book makes an excellent choice for their own devotions.

Some of the stories are tailored more toward an educator audience. "The Science of Crime" and "Origami Magic" are chapters with messages directly aimed at encouraging and supporting teachers of all levels.

This book is excellent for educators and classrooms as it applies to many curriculum areas. Many different STEM paths are mentioned, including geometry, aerospace engineering, robotics, and physics, to name a few. Subjects outside of STEM are also applied, such as history, art, and religion. This book could serve to make cross-curriculum connections. For example, science and art classes can be connected through devotionals like "Origami Magic." The book also lends itself to combining science and art projects. For example, students can learn about, and then test, building robots or creating slime while strengthening their walk with God.

While this book is an asset in the classroom, there are points that educators should know before using this book as an educational tool. Barizo, in most devotionals, provides definitions for the scientific terms included. Some terms are missed, however, so teachers would be wise to read ahead and prepare definitions for terms they believe may be unfamiliar to their students. I recommend that teachers pre-read for any content that

Some Content Examples:

Devotionals:
Learning From Nature
Barbie in Space!
Bee Engineering
Biobullies: Alien Invaders
Caring is Sharing
Child's Play
Finding Fakes
From Trash to Music
Garbage Gobblers
In Praise of Slime
Getting Lost
Have Winglets, Will Soar!
The Science of Crime
Making Things New

Chapters:
Horseshoe Crabs Save Lives
Let It Snow!
Magnetic Moments
Mind-Controlled Prosthetics
Mushroom Engineering
Plug in the Power!
Robotic Realities
Seeing God Through Our Senses
These Shoes Help the Blind "See"
The James Webb Telescope
The Lost Is Found
The Wondrous Proton
The Science of Scent
Windy Wonders
You May Eat Your Food Wrapper!

may not be appropriate for their specific audience. The book is, at the moment, culturally relevant. For example, Barizo makes references to the COVID-19 pandemic and *Barbie* (the movie). However, as the years go on, these references may be less prevalent, and teachers must re-evaluate their effectiveness.

Seeing God Through STEM is a compelling, well-written book by a respected and successful Adventist educator. It holds a deep value for educators at all levels and subjects. This book has heart and knowledge and will draw readers into a deeper relationship with their Creator. While there is always room for improvements, such as including STEM activities or an index sorting devotionals by their inclusion of different STEM topics, the author accomplishes and exceeds the goals she sets out. Considering all this, I highly recommend this book to educators for use in their classrooms. In a world where science and religion seem to be frequently placed at odds, *Seeing GOD Through STEM* shows educators and students how God's greatness and love are shown in the world around us and that STEM subjects are a vital part of God's plan.

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The articles in this issue are a collection of reflections on topics that speak to wholistic education: the mental, physical, social, and spiritual. The rise of generative Artificial Intelligence has impacted education globally. It has forced educators to think about how best to navigate this technological advancement's moral, ethical, and practical use. JAE will be publishing throughout the year several articles on the topic (see "Generative AI in Adventist Education" by David P. Harris and Fred Armstrong in the previous issue [https://www.journalofadventisteducation.org/2023.8 5.2.2]). In this current issue, Lorin Koch addresses "ChatGPT in the Classroom: Recommendations for Use, Limitations, and Student and Teacher Experiences" and provides helpful recommendations for practical use by educators as they shape the learning environment for all learners. Shondell DeVelde takes an evidence-based approach to teaching students about healthful food choices in "Promoting Plant-based Diets in Seventh-day Adventist Schools." We are excited to share a reprint of an article by Wilf Rieger, first published in *TEACH Journal of Christian Education*, on character development as a hallmark of Christian education titled "Rick Warren and Ellen G. White on Christian Character Development: An Unexpected Meeting of the Minds?" Our Perspectives section shares an adapted transcript of a presentation by Siroj Sorajjakool to the Seventh International Scholars Conference in Bandung, Indonesia (October 19, 2019) titled "Academia, the Sabbath, and the Fourth Industrial Revolution" in which he reflects on the challenges of navigating technological change within the context of Adventist education.

The remaining articles address resources for improving instruction: "The Geoscience Research Institute: A Resource for Teaching a Biblical Understanding of Earth History" by Emeraude Victorin Tobias; "Best Practice Approaches for Multigrade Education" by Andrea Gray; and Bianca Loss' review of Ophelia Barizo's book, *Seeing GOD Through STEM*.

We hope these articles stimulate your thoughts as you make curriculum decisions, plan instruction, and seek ways to cultivate a learning environment that leads and nurtures learners as they develop a vibrant, personal relationship with Jesus Christ. The Lord is in our Adventist schools, and we are sometimes unaware of it. Every Adventist school ought to be a "house of God . . . the gate of heaven,"[4] where every child, man, and woman, can come face to face with God through the Ladder who has been sent down from heaven, Jesus Christ Himself.

Andrew Mutero, PhD, *is the Education Director for the East-Central Africa Division, headquartered in Nairobi, Kenya. This division includes the countries of Burundi, the Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, South Sudan, Uganda, and Tanzania. He also serves as a consultant on* THE JOURNAL OF ADVENTIST EDUCATION® *Advisory Board.*

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