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Kamal Middlebrook  
*Morehouse College*

Kinnis Gosha  
*Morehouse College*

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# The Effectiveness Of An ECA In Providing Spiritual Guidance To College Students

*Kamal Middlebrook*  
*Research Scholar*  
*Morehouse College*  
 Email: [kamal.middlebrook@morehouse.edu](mailto:kamal.middlebrook@morehouse.edu)

*Kinnis Gosha*  
*Assistant Professor*  
*Morehouse College*  
[kinnis.gosha@morehouse.edu](mailto:kinnis.gosha@morehouse.edu)

**Abstract:** Over the years, an increase in the need and want for spiritual guidance has increased in college students; the spiritual development they seek yields positive outcomes. College students turn to educational institutions for tools that provide spiritual guidance; therefore, we decided to find an alternative way of providing spiritual guidance to college students. The spiritual conversational agent, Reverend Claudia, was used for college students to turn to and seek spiritual guidance because there are situations that may cause embarrassment for students when they seek guidance from a live person. Reverend Claudia was compared to a text-only, spiritual website to assess which would provide more spiritual guidance for participants.

**Keywords:** college, eca, guidance, spiritual

## I. Introduction

When deciding to conduct research on the effectiveness of an embodied conversational agent (ECA) in providing spiritual guidance to college students, there was an issue in assessing the relationship between religion and ECAs simply because there is currently no literature that assesses the relationship between these two factors. There is evidence that explains why research should be done to analyze the two factors, however.

## II. Literature Review

Spiritual development theories have been a part of college student development theory literature for over 30 years; however they have only been a part of the mainstream literature within the last decade. In a study done by Love (2002), three spiritual development theories were compared with traditional cognitive development theories, and the analysis done revealed commonalities between the two sets of theories and unique contributions to an understanding of student development on the part of spiritual

development. In Troup's (2010) work, he explained a myriad of psychological theories of development in which he concluded that understanding the spiritual identity development of college students is important because in the college environment students experience dissonance as they are confronted by people, ideas, and events that contradict the knowledge and beliefs they developed during childhood. In "Faith development: Stages to religious maturity," Warner (2011) cited Gold (2010) saying that "spiritual growth happens only when one makes the conscious choice to accept the idea that boundaries of knowledge fall far short of the boundaries of human experiences". This conscious choice is important given that "spiritual development constitutes moving toward greater authenticity or to a more authentic self" (Tisdell, 2003, p. xi). When discussing spiritual development, this is not synonymous with religion as they "are not the same, but for many people they are interrelated" (Komives, Lucas, & McMahon, 2007; Tisdell, 2003, p. xi). According to Komives et al. (2007) "the human spirit is the core of your being that gives life its meaning. It is what helps you get out of bed in the morning and look forward to the new day. As such, it needs to be nurtured" (p. 320). We see that spiritual development is related to cognitive development, and it is needed to strengthen the ideas that college students first developed during childhood; consequently, it will further develop a college student's sense of self. It is important to provide college students with an alternative way of getting the spiritual development they need when traditional methods are unavailable.

As aforementioned, there is a growing interest on the spiritual development of college students (Love, 2001). The theory of faith development, created by Fowler (1981), posits that faith is a holistic orientation and that the various stages of faith development are uniform. Parks' book, written in 2000, expanded Fowler's (1981) work by proposing that an additional stage of faith development occurs from adolescence to adulthood,

which also includes college aged students. The spiritual development received during college years may affect involvement in social, volunteer, leadership, and community service activity may be a manifestation of their spiritual development and quest for meaning (Parks, 2001). Thus it is important to create spaces where students can explore questions about their spirituality and receive resources that will assist them in their journey.

In “Applying student development theory to college students spiritual beliefs,” Holmes, Roedder, and Flowers (2004) found that students relied heavily upon various institutional agents for assistance in learning more about and developing their spiritual beliefs in college, and specifically peer and mentoring relationships were instrumental to students and shaped how students made meaning of their academic and social experiences in college. According to Holmes et al. (2004), students who did have doubts about their faith did not stall in their spiritual development because their mentor helped them understand that questioning one’s faith in relation to the beliefs of others. Doubting religious beliefs is natural part of coming to understand themselves as young men of faith (Holmes et al., 2004). Where does a student on a campus without a campus pastor go when they need to gain information about a faith? This virtual mentor tool is meant to assist with this conundrum.

Jones (2014) cited Astin, Astin, and Lindholm (2011) “Cultivating the spirit: How college can enhance students’ inner lives,” a study that involved 112,000 college students and assessed the effects of religion and spirituality on college students, as support for saying that “colleges and institutions of higher education ought to pay more attention to their students’ spiritual development” because Astin et al. (2011) provided results that showed religious and spiritual development positively impacts the quality of life for college students. Their findings suggested that religious and spiritual development affected three areas in the life of a college student. “First, spiritual growth made a difference in academic/intellectual outcomes, in areas such as college grades, educational aspirations, and intellectual self-esteem. Second, spiritual growth positively influenced personal/emotional outcomes, such as psychological well-being, leadership abilities, and satisfaction with college. Third, spiritual growth during college led to improved attitudinal outcomes, including growth in the areas of multicultural understanding and sensitivity.” The ECA, or virtual mentor, has a purpose of providing college students with the religious/spiritual guidance and development

that Astin et al. (2001) mentions will positively influence college students.

Because there may be a deficiency in college students seeking spiritual guidance as a result of the embarrassment they may receive for discussing certain issues with religious leaders, alternative methods of providing spiritual guidance need to be developed. An alternative way of providing college students with the spiritual guidance they need in order to improve psychological health, academic success, and emotional development is to use an embodied conversational agent. Embodied conversational agents, or ECAs, have been defined as “anthropomorphic interface agents which engage a user in real-time dialogue, using speech, gesture, gaze, and verbal and nonverbal channels to emulate the experience of human face-to-face interaction” (Bickmore & Cassell, 2001). In other words, ECAs are computer generated characters that demonstrate human-like characteristics like verbal communication and eye contact, which foster face to face conversations. When defining and describing an ECA, André and Pelachaud (2010) concluded that virtual characters allow for communication styles common in human-human dialogue. We are testing an ECA to determine if it will be a sufficient alternative to a human spiritual leader. Furthermore, Bickmore and Cassell (2001) stated that “ECAs are designed to provide an experience similar to interacting with another person as opposed to simply finding text on a website, reading a book or watching a video” (Bickmore & Cassell, 2001). We will compare the ECA used in the study, Reverend Claudia, to a text only website that will contain the same religious and spiritual information. Websites that contain exclusively words are thought to be tedious in reading and do not foster person-person relationships. Because of this, it is hypothesized that the ECA will be ranked higher in the measures being assessed, which are effectiveness, user satisfaction, and likelihood of returning to the website. Also, we hypothesize that the ECA will not only be more effective than the text only website, but it will be considered effective overall by participants. Effectiveness will be operationally defined as whether or not participants learn something from the websites that they can apply to their everyday lives.

### III. Method

#### *Participants*

The research study will be conducted twice; therefore, there will be two different sets of participants. The pilot study participants were eighteen middle school and high school students from schools in Atlanta, Georgia. The participants of the

larger study are expected to be 80 college students attending Morehouse College, Spelman College, and Clark Atlanta University.

#### *Measures*

For the pilot study, an online survey was constructed using Google Forms. This survey assessed whether or not the participants are embarrassed to ask religious questions, if the participants would use the ECA again, and how many, if any, questions on the ECA website the participants did not understand.

An online survey was created using Qualtrics.com. The survey consists of questions that assess numerous factors of either the spiritual conversational agent or the text-only website: user satisfaction, likelihood of returning to the website, effectiveness of the spiritual conversational agent in providing spiritual guidance, and the effectiveness of the spiritual conversational agent compared to the text-only spiritual website.

Each participant was asked to indicate their sex, age, which institution they attend, classification, if they attend religious worship services, their stress levels, and either their opinions on the spiritual conversational agent or their opinions on a text-only spiritual website.

The surveys also asked participants to list the ten most important questions they saw on the website they were assigned. The purpose of this question was to indicate what questions and concepts should be kept on the spiritual conversational agent website as it is further developed. The content that is not currently on the website, but should be included because of its relationship with the situations that college students actually experience and need guidance in will also be included on the website in the future. A question was placed on both surveys to analyze this concept as well.

#### **IV. Results**

The data collected from the pilot study showed that of the eighteen participants twelve were male (70.6%) and five were female (29.4%). Seventeen of the participants were African American (94.4%) and one was Hispanic (5.6%). When it came to grade level, one participant was in the sixth grade (5.9%), five participants were in the seventh grade (29.4%), two participants were in the eighth grade (11.8%), two participants were in the tenth grade (11.8%), two participants were in the twelfth grade (11.8%), and five participants were high school graduates (29.4%). When asked about the

#### *Procedure*

As stated above, there will be a pilot study done before the actual study is conducted. The participants for the pilot study will be recruited from middle and high schools in Atlanta, Georgia. The study will be conducted in the Culturally Relevant Computing Lab at Morehouse College. The participants will be instructed to interact with the ECA, Reverend Claudia, and select three questions to ask. After asking the ECA three questions of their choosing, the participants will complete an online survey created using Google Forms.

The participants for the actual study in the fall will be recruited using both e-mail and on-campus promotions. After eighty participants are found, an e-mail notification will be sent to the prospective participants to notify them of a meeting to discuss the purpose of the research study and to provide consent forms for the participants. There are no foreseen risks of the research. The participants will receive an incentive of a movie-style box of candy after the survey session.

The participants will be randomly assigned to two groups, one group will interact with a spiritual conversational agent and the other will interact with a text-only, spiritual website. The participants will interact with their assigned medium of spiritual guidance for approximately fifteen minutes, so that they get acquainted with the website. After the fifteen minute period, the participants will take the survey to assess the website to which they were assigned. The independent variable of the research study is the medium of spiritual guidance the participants are assigned to, and the dependent variables are user satisfaction, likelihood of returning to the website, and effectiveness.

participants' religion, seventeen of them were Christian (94.4%) and one was Jewish (5.6%).

The participants were asked if there were any questions they did not know the answer to before listening to Reverend Claudia, and the survey showed that five participants answered no (27.8%), eight participants answered some (1-3 questions) (44.4%), and five participants answered many (4-6 questions) (27.8%). The survey also asked if the participants were ever embarrassed to ask a person a religious question. Ten of the participants said they are never embarrassed (55.6%), seven of the participants said they are sometimes embarrassed (38.9%), and one of

the participants said he or she is very embarrassed (5.6%). When asked if they would use Reverend Claudia again, six participants said yes (33.3%), four participants said yes, only if additional questions and answers are added (22.2%), and eight participants said no (44.4%). The results show that out of the eight participants who said they do feel embarrassed to ask religious questions, seven of them would use Reverend Claudia again (87.5%). While seven of the ten participants who said they are never embarrassed to ask a religious question said they would not use Reverend Claudia again (70%), the remaining three of the ten participants said they would still use Reverend Claudia again (30%).

The relationship between grade level and being embarrassed to ask a religious question was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a weak, negative correlation between the two variables,  $r = -.14$ ,  $n = 17$ ,  $p = .59$ , and the correlation was not statistically significant.

The relationship between grade and previous knowledge of the questions on the ECA website was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a weak, positive correlation between the two variables,  $r = .14$ ,  $n = 17$ ,  $p = .58$ , and the correlation was not statistically significant.

## V. Discussion

In an effort to find an alternative way of providing spiritual guidance to college students, an embodied conversational agent was created. During the pilot study, the relationships of a myriad of variables were assessed: grade level and being embarrassed to ask religious questions, grade level and knowing the content on the ECA website, grade level and the likelihood of returning to the ECA website, being embarrassed to ask religious questions and knowing the content on the ECA website, being embarrassed to ask religious questions and the likelihood of returning to the ECA website, and knowing the content on the ECA website and the likelihood of returning to the ECA website.

When analyzing the results of the Pearson product-moment correlation coefficient performed, we see that the only statistically significant relationship was between being embarrassed to ask religious question and the likelihood of returning to

The relationship between grade and the likelihood of using Reverend Claudia again was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a moderate, positive correlation between the two variables,  $r = .41$ ,  $n = 17$ ,  $p = .10$ , and the correlation was not statistically significant.

The relationship between being embarrassed to ask religious questions and the likelihood of using Reverend Claudia again was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a moderate, negative correlation between the two variables,  $r = -.63$ ,  $n = 18$ ,  $p = .005$ , and the correlation was statistically significant.

The relationship between the likelihood of using Reverend Claudia again and previous knowledge of the questions on the ECA website was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. There was a weak, negative correlation between the two variables,  $r = -.34$ ,  $n = 18$ ,  $p = .16$ , and the correlation was not statistically significant.

the ECA website. The correlation between the two variables was moderately negative because of the accumulation of participants who answered that they are never embarrassed to ask religious questions and the number of participants who said they would return to the Reverend Claudia website. We looked more into the responses from these two variables and found that 87.5% of the participants who are either sometimes embarrassed or very embarrassed to ask religious questions would use the ECA again, and 30% of the participants who are never embarrassed to ask religious questions would still use the ECA again. Not only can we conclude that individuals who are embarrassed to ask religious questions are more likely to use an ECA to receive spiritual guidance, but nearly one-third of people who are not embarrassed will still use an ECA to receive spiritual guidance. Providing students with an effective alternative for providing spiritual guidance that will curtail the embarrassment they may experience was

one purpose of the study, which we can infer has been done.

Since the other correlations were not statistically significant, we cannot show any relationship between the variables that were analyzed. The pilot study had limitations that were due to the age range of the participants. The purpose of the study is to provide spiritual guidance to college students, but the pilot study was conducted using middle and high school students. This limitation in design may explain the participants not knowing some of the content on the ECA website or being embarrassed to ask religious questions. The pilot study was also limited in only being able to interact with the ECA and not the text-only website, which will not be an issue when the actual study is conducted. General limitations of the study include the set-up of the questions on the ECA website and the religious exclusivity of the study. The questions that are currently being used for the study are more of explanations of religious concepts than real-life

situations that provide spiritual guidance; this will be resolved after the responses of the actual study have been collected. The study is exclusively Christian because we chose use Christianity as the starting point for religious ECAs. Also, the majority of the students in the Atlanta University Center are Christian. This will also be resolved after the responses from the actual study have been collected.

The limitations listed above lead us to the future development of the study. Besides the completion of the actual study done in the fall of 2015, the design of the ECA will be better developed to provide spiritual guidance. The questions and real-life situations that college students would like to seek spiritual guidance about will be incorporated into the ECA website, and the ECA will be able to appeal to students who subscribe to religions other than Christianity. With the help of the participants, we will be able to create an embodied conversational agent that can efficiently and effectively provide all college students with spiritual guidance.

## VI. Appendix

### Pilot Study Survey

1. What is your gender?
  - a. Male
  - b. Female
2. What is your ethnicity?
  - a. Black or African American
  - b. Caucasian
  - c. Hispanic
  - d. Asian or Asian American
  - e. Other
3. What grade are you in?
  - a. 5th
  - b. 6th
  - c. 7th
  - d. 8th
  - e. 9th
  - f. Other: \_\_\_\_\_
4. Were there any questions you did not know the answer to before listening to Reverend Claudia that was listed on the website?
  - a. No (0)
  - b. Some (1-3)
  - c. Many (4-6)
  - d. Most (7 or more)
5. Are you ever embarrassed to ask a person a religious question?
  - a. I am never embarrassed to ask
  - b. I am embarrassed sometimes to ask
  - c. I am very embarrassed to ask
6. What religious group do you most identify with?
  - a. Christian
  - b. Jewish

- c. Muslim  
 d. None  
 e. Other: \_\_\_\_\_
7. Would you use Reverend Claudia again?  
 a. Yes  
 b. Yes, only if additional questions and answers are added  
 c. No
8. What did you learn from Reverend Claudia?
9. What questions or other info should be added to the list for Reverend Claudia?

## Codebook

| Variable  | SPSS Variable Name | Coding Instructions  |
|---|--------------------|--|
| Participant ID  | ID                 | Number assigned to survey  |
| What is your gender?  | gender             | 1=Male<br>2=Female   |
| What is your ethnicity?   | ethnicity          | 1=Black or African American<br>2=Caucasian<br>3=Hispanic<br>4=Asian or Asian American<br>5=Other         |
| What grade are you in?  | grade              | 1=5th<br>2=6th<br>3=7th<br>4=8th<br>5=9th<br>6=10th<br>7=11th<br>8=12th<br>9=High School Graduate        |
| Where there any questions you did not know the answer to before listening to Reverend Claudia that was listed on the website? | claudia.questions  | 1=No (0)<br>2=Some (1-3)<br>3=Many (4-6)<br>4=Most (7 or more)   |
| Are you ever embarrassed to ask a person a religious question?  | claudia.embarrass  | 1=I am never embarrassed to ask<br>2=I am embarrassed sometimes to ask<br>3=I am very embarrassed to ask |
| What religious group do you most identify with?   | religion           | 1=Christian<br>2=Jewish<br>3=Muslim<br>4=None<br>5=Other   |
| Would you use Reverend Claudia again?   | claudia.again      | 1=Yes<br>2=Yes, only if additional questions and answers are added<br>3=No                               |

| Gender |        |           |         |               |                    |
|--------|--------|-----------|---------|---------------|--------------------|
|        |        | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid  | male   | 12        | 66.7    | 70.6          | 70.6               |
|        | female | 5         | 27.8    | 29.4          | 100.0              |

|         |        |    |       |       |  |
|---------|--------|----|-------|-------|--|
|         | Total  | 17 | 94.4  | 100.0 |  |
| Missing | System | 1  | 5.6   |       |  |
| Total   |        | 18 | 100.0 |       |  |

| Ethnicity |                           |           |         |               |                    |
|-----------|---------------------------|-----------|---------|---------------|--------------------|
|           |                           | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid     | Black or African American | 17        | 94.4    | 94.4          | 94.4               |
|           | Hispanic                  | 1         | 5.6     | 5.6           | 100.0              |
|           | Total                     | 18        | 100.0   | 100.0         |                    |

| Grade   |                      |           |         |               |                    |
|---------|----------------------|-----------|---------|---------------|--------------------|
|         |                      | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid   | 6th                  | 1         | 5.6     | 5.9           | 5.9                |
|         | 7th                  | 5         | 27.8    | 29.4          | 35.3               |
|         | 8th                  | 2         | 11.1    | 11.8          | 47.1               |
|         | 10th                 | 2         | 11.1    | 11.8          | 58.8               |
|         | 12th                 | 2         | 11.1    | 11.8          | 70.6               |
|         | High School Graduate | 5         | 27.8    | 29.4          | 100.0              |
|         | Total                | 17        | 94.4    | 100.0         |                    |
| Missing | System               | 1         | 5.6     |               |                    |
| Total   |                      | 18        | 100.0   |               |                    |

| Religion |           |           |         |               |                    |
|----------|-----------|-----------|---------|---------------|--------------------|
|          |           | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid    | Christian | 17        | 94.4    | 94.4          | 94.4               |
|          | Jewish    | 1         | 5.6     | 5.6           | 100.0              |
|          | Total     | 18        | 100.0   | 100.0         |                    |

| Claudia.Questions |            |           |         |               |                    |
|-------------------|------------|-----------|---------|---------------|--------------------|
|                   |            | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid             | No (0)     | 5         | 27.8    | 27.8          | 27.8               |
|                   | Some (1-3) | 8         | 44.4    | 44.4          | 72.2               |
|                   | Many (4-6) | 5         | 27.8    | 27.8          | 100.0              |
|                   | Total      | 18        | 100.0   | 100.0         |                    |



| Claudia.Embarrass |                                   |           |         |               |                    |
|-------------------|-----------------------------------|-----------|---------|---------------|--------------------|
|                   |                                   | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid             | I am never embarrassed to ask     | 10        | 55.6    | 55.6          | 55.6               |
|                   | I am embarrassed sometimes to ask | 7         | 38.9    | 38.9          | 94.4               |
|                   | I am very embarrassed to ask      | 1         | 5.6     | 5.6           | 100.0              |
|                   | Total                             | 18        | 100.0   | 100.0         |                    |

| Claudia.Again |   |           |         |               |                    |
|---------------|---|-----------|---------|---------------|--------------------|
|               |   | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid         | Yes   | 6         | 33.3    | 33.3          | 33.3               |
|               | Yes, only if additional questions and answers are added | 4         | 22.2    | 22.2          | 55.6               |
|               | No  | 8         | 44.4    | 44.4          | 100.0              |
|               | Total   | 31        | 96.9    | 100.0         |                    |

| Correlations      |                     |       |                   |                   |               |
|-------------------|---------------------|-------|-------------------|-------------------|---------------|
|                   |                     | grade | claudia.embarrass | claudia.questions | claudia.again |
| grade             | Pearson Correlation | 1     | -.141             | .144              | .410          |
|                   | Sig. (2-tailed)     |       | .589              | .582              | .102          |
|                   | N                   | 17    | 17                | 17                | 17            |
| claudia.embarrass | Pearson Correlation | -.141 | 1                 | .372              | -.634**       |
|                   | Sig. (2-tailed)     | .589  |                   | .128              | .005          |
|                   | N                   | 17    | 18                | 18                | 18            |
| claudia.questions | Pearson Correlation | .144  | .372              | 1                 | -.341         |
|                   | Sig. (2-tailed)     | .582  | .128              |                   | .166          |
|                   | N                   | 17    | 18                | 18                | 18            |
| claudia.again     | Pearson Correlation | .410  | -.634**           | -.341             | 1             |
|                   | Sig. (2-tailed)     | .102  | .005              | .166              |               |
|                   | N                   | 17    | 18                | 18                | 18            |

\*\*Correlation is significant at the 0.01 level (2-tailed).

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