

# **IMSM Qualifying Zone (Family Interactive Area) Visitor Study Plan**

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## **Introduction**

Visitor studies are defined as studying the behavior of visitors in exhibition venues of all types (Bitgood & Shettel, 1996, p. 6). The scope of visitor studies includes five areas of study: 1) audience research and development, 2) exhibit design and development, 3) program design and development, 4) general facility design, and 5) visitor services (1996, p. 6). These five areas will often overlap during a study.

Visitor studies are useful for gaining detailed information about visitors' experiences in a museum. This is especially important if a museum has recently been renovated, staff have expressed interest in gaining a clearer understanding of their audience and their needs, or they have made major changes to their mission and vision statements.

## **Visitor Study Needs Assessment**

### **Team Focus**

The team's focus area is the Qualifying Zone at the Indianapolis Motor Speedway Museum (IMSM). The Qualifying Zone is a large open, one entrance and exit gallery consisting of nine activity stations for visitors. The IMSM uses digital and analog interpretation tools to give guests of all ages a hands-on experience at the Museum (IMSM, 2025). The IMSM's mission is "to celebrate and preserve the history behind the Indianapolis Motor Speedway and the Indianapolis 500", and their vision is "to spark curiosity and ignite discovery" (2025). The Qualifying Zone is important to their mission and vision statements because one of the best ways to celebrate and preserve history is by passing it down to a new generation. Furthermore, the interactive activity stations align with their vision statement of sparking curiosity and igniting discovery. Each station was created to give visitors insight into the components and strategies of the Indy 500.

The Qualifying Zone was constructed during IMSM's renovation to align with their new mission and vision statements, and to attract families, which is a new audience for the museum. While the current audience for the museum is older white males, the museum has designed the Qualifying Zone with the target audience being kids ages 8 – 14. During the Museums & Audiences class meeting with the staff, Jake Apollos stated, "Even kids who live close by do not go to the museum... They only get one field trip a year" (Apollos, Brenneman and Dunbar, 2025, 1<sup>st</sup> class meeting). The location of the IMSM can draw in a larger audience, and with these new renovations, the staff hopes to do so. The Qualifying Zone directly targets this by having a more modern, engaging space that invites families of all kinds to participate in something that is not only fun, but educational.

The Qualifying Zone has one main objective: Visitors will learn how the Indy 500 functions through educational and interactive activity stations (J. Apollos, personal communication, April 8, 2025). As previously stated, their main demographic was primarily older white men who were already significantly knowledgeable and enthusiastic about the Indy 500. The emphasis on understanding other demographics has not shifted until recently with the renovations taking place. The museum is making their institution more enticing for a younger generation by collaborating with educators for a fun, but educational experience. Each activity station focuses on Strategy, Pit Crew, or Driver, and the Rookie section for smaller children. This will include car disassembly to explore the parts of a racing car, three racing reflexes stations, a pit crew station to simulate replacing tires and fuel, and a five-minute racing simulator. All activity stations have a competitive element to them, making them great for groups and families. By putting family experience first, families can tell the museum what they are interested in, how they want to learn about a topic, and what makes the experience personally memorable for them (Rand, Kiihne, & Watkins, 2009, p. 2). This will create unique memories

for each family that participates in an activity station. The Qualifying Zone is important for IMSM's goals of creating enriching experiences, attracting new members, and maintaining their existing members. It will initiate interest in racing, cars, and their history within Indiana.

### **Current Knowledge about Relevant Audiences**

The Qualifying Zone is a new addition to the museum, so there is not enough information about the target audience, which is 8-14-year-olds. The IMSM staff expressed interest in understanding this demographic better, but they have extremely limited knowledge about them (Apollos, Brenneman and Dunbar, 2025, 1<sup>st</sup> class meeting). During a virtual museum tour, Jake Apollos stated the Qualifying Zone had the most screens of any location in the museum, and IMSM believes this factor will grab the attention of their intended target audience (Virtual Museum Tour, 2025). However, because the Qualifying Zone is brand new, no visitor evaluation has been conducted within this space and its target audience.

The IMSM website has little information about how this museum may be interesting to the Qualifying Zone's target audience. If children are not visiting the museum in a school group, they are more likely to come with an adult for their personal entertainment. The Field Trips & Educational Programming section on the website does not mention the Qualifying Zone nor its specifics to entice younger visitors. It gives the impression that children, specifically their 8-14 target audience, are lacking from this space. This could potentially deter this audience from attending this museum if they are not aware of areas such as the Qualifying Zone. Some visitors may arrive at a gallery, take a quick look around, then leave (Hein, 1998, p. 105). Although a visitor may glance at a gallery for a multitude of reasons, the Qualifying Zone needs to motivate visitors to enter by giving them something to anticipate beforehand. This visitor anticipation will inform IMSM about their wants, needs, motivations, and behavior in the museum.

### **Audience Evaluation Needs**

The IMSM staff stated that their current primary audience – their “bread and butter” - are race fans (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting). Within this group, their audience is often older men. Their current goal is to expand their audience, with particular focus on families with the goal of “jumpstarting their passion” for motorsports (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting). They specifically want to be able to compete with other Indianapolis institutions such as the Indianapolis Children’s Museum, the Indiana State Museum, the Indianapolis Zoo, and Conner Prairie (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting; Apollos, Brenneman, Dunbar, 2025, last class meeting).

During the museum walk-through, Apollos (2025) stated that the IMSM is interested in learning where visitors are interacting the most within the Qualifying Zone, how long visitors are spending at each station, and if visitors are understanding how to use the stations. Apollos (2025) was also interested in the perceived value of the Qualifying Zone to visitors. From this, the museum can determine that engagement (circulation and physical use of space) and value (outcomes and benefits) are the key objectives for the IMSM’s Qualifying Zone.

Given what is known about the IMSM mission and values, it is evident that the museum's objectives align with the visitor study plan created for the Qualifying Zone. This study offers a solid foundation for understanding how visitors use the Qualifying Zone and what they are gaining from it as a new addition to the IMSM. These studies will be able to give the IMSM staff a better understanding of their visitors’ behaviors and learning and can identify potential areas for further evaluation.

### **Guiding Research Objectives**

The IMSM staff discussed how their current audience consist of older white men. While this might be their current audience, IMSM has expressed their desire to broaden their audience to focus on families (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting). With this target

audience being new to the museum, it is important to create studies that aid in understanding this focus. The research objectives for the first study are circulation, use of space, and social interactions. This study aims to identify how visitors are moving throughout the Qualifying Zone, what interactives and stations they are engaging with, and how they are interacting with the people around them (Silverman, 2025). These research objectives are essential for the IMSM team to study because the Qualifying Zone is a new space for the museum, so there have been no evaluation studies conducted within this space. Since this area is new, it is important to identify how visitors are experiencing the stations within this space. Overall, this study can give useful insights into the use of the Qualifying Zone.

The research objectives for the second study are outcomes, benefits, and demographics. This study aims to obtain data about a visitor's experience in the Qualifying Zone. Such as, if they enjoyed their experience, learned anything, and visited this area of the museum (Silverman, 2025). These research objectives are vital to the IMSM because they will identify which stations are being most and least used by visitors. While the IMSM team stated the layout of the Qualifying Zone cannot be changed, this study has the potential to influence changes involving instructional and visual elements (Apollos, Brennehan, Dunbar, 2025, 1<sup>st</sup> class meeting). Since this space is new, it is ideal for the staff to get an idea of who is currently using the space and if it is being used by the intended audience of children aged 8–14. Obtaining an idea of who their audience is and how they are enjoying the Qualifying Zone can inform other decisions throughout the museum. Interactives are also new for this museum and identifying which ones are working can be useful for their future endeavors. Overall, both studies have the potential to inform the IMSM staff of how the Qualifying Zone is being used and perceived by visitors.

## **Literature Review**

This visitor study plan is informed by additional research on 3 key topics: 1) how the target audience of children and teenagers experience museums, 2) observation and survey evaluation methods, and 3) engaging participatory experiences.

### **Target Audience**

Children and teenagers experience museums differently than adults do, and they often have different expectations from a museum than their older counterparts. For example, young children require more educator and adult facilitation to support their learning through scaffolding and modeling behavior (Jensen, 1994, p. 301). On the other hand, teenagers require less scaffolding and value their identity and the socialization aspect more. Teenagers must choose between standing off on the sidelines or actively engaging in the experience as a willing participant (Striepe, 2013, p. 211). However, both children and teenagers will come to a museum with their family. Coming with their family combines learning, identity, and socialization elements together for family learning. A family museum experience has many similarities to child and teenage learning, but the main difference is the social dynamics. Informal family learning gives families the opportunity to do something interesting together (Dierking, 1989, p. 9), whereas the previously stated learning experiences are more individualistic. Informal family learning is a fun, playful, and social experience and it is often influenced by the age of the children and adults in the group (Rand, Kiihne, & Watkins, 2009, p. 2). The goal for informal learning in a museum is to have a lasting impact after the visit initially occurred so visitors will be more likely to come back. When children engage in new activities, they begin to form a new lens on the behaviors and relationships in their lives (Jensen, 1994, p. 304). This, in turn, will cause them to think more critically about the world around them. For teenagers, they seek out representation, identities, and activities that align with them (Striepe, 2013, p. 209–211).

The IMSM's target audience of 8-14-year-olds falls into this category. Children and teenagers require different motivations to learn something they would originally not be interested in and need to find a reason to learn more about it. This may be in the form of a child's individual learning experience, a group of teenagers trying something new together as a way of bonding and socializing, or informal family learning with adults, children, and teenagers. Informal family learning combines learning, identity, and socialization together to create a unique experience for each family. These findings relate to the proposed studies because both studies seek to gain more information about the target audience, their experiences, and their behaviors in the Qualifying Zone.

### **Evaluation Methods**

When creating an evaluation study, it is imperative museums decide the purpose of their study before identifying the methods they want to use. The purpose of the study includes identifying strengths and weaknesses of an exhibit, understanding visitors and non-visitors, and determining if an exhibit's learning outcomes have been met (Renaissance East of England, 2009, pp.14-16). Once the study's purpose is identified, evaluators will decide the guiding questions that will set the tone for the study. After all this information is finalized, the evaluation method must be selected. When selecting an evaluation method, it is important to align the needs and purpose of the study with the method selection (Back & Spence, 2022, p.182). Observations are often one of the more favored evaluation methods for museum visitor studies. Observations "provide a rich, holistic view of all that takes place during a program or how audiences interact with a museum product" (Nelson & Cohn, 2015, p. 29). ("Data Collection Methods for Evaluating Museum Programs and Exhibitions") While this method can be time consuming to document and observe visitors in a museum setting; it provides evaluators with fruitful information on how visitors are interacting with the space. Observations can take multiple forms.

For this study, the observation will feature a mix of checklists, as well as timing and tracking. Both will allow the evaluator to study the visitors' movement and how they interact throughout the exhibit space. They will also note which "exhibits visitors stop at, how long they stop, and what they do at each exhibit" (Nelson & Cohn, 2015, p. 30). The observation method allows evaluators to gather a lot of data without impeding the visitors' experience. The second method being used in this study is a survey. Surveys work best when a museum needs to "get a response from a large number of people in a relatively short time" (Renaissance of East England, 2009, p. 31). This method is heavily reliant on the visitor's willingness to participate by filling out the survey completely. The questions within these surveys can tackle an array of subjects. Some common topics include "information about people's knowledge, awareness, satisfaction, expectations, behavior, preferences and beliefs, as well as demographic data" (Renaissance of East England, 2009, p. 31). Observations and surveys are useful methods when conducting visitor studies within a museum setting. Both can produce useful and important data that can identify key takeaways from exhibits.

Conducting evaluations is new for the IMSM staff and so is the Qualifying Zone space. Because both areas are unfamiliar territory for this museum it is important to understand the reason behind the choices for the methods. One of the studies focuses on the way visitors interact with the Qualifying Zone. Since this study focuses on interactions, the observation method will allow for proper data collection of the types of interactions visitors are having within this space. The other study focuses on the outcomes and benefits of the Qualifying Zone. This study's focus requires more detailed data than an observation can obtain. Surveys are a great fit for the type of information that needs to be collected in this study. It is also important to note the IMSM will also be operating these studies with only a few staff members and surveys allow that to happen. Overall, these sources identified the benefits of observations and surveys and the type of

information both methods collect. This information is extremely helpful when creating these studies and has helped inform decisions for each study.

### **Engaging Participatory Experiences**

As mentioned, the Qualifying Zone is a new area for the IMSM and a highly interactive area. The stations within this space need to meet visitor expectations, while also supporting the IMSM mission and values (Simon, 2010, p. iii). These evaluation studies will identify if this is successful. It is crucial to understand the interactive, participatory experiences within museums. A key way to achieve this is to provide a unique experience that is rooted in the visitor's ability to "make connections and find relevance" (Fisher, 2023, p. 104).

Interactive elements should not solely be for fun or entertainment, though there is value in this outcome; museums have noted that the best results come when visitor needs are also met (Simon, 2010, p. 16-17). For the IMSM, this can be evaluated by considering their vision of "igniting curiosity" and "sparking discovery" to further understand motorsports (IMSM 2025). As Simon (2010) states, these participatory experiences are about both the process as well as the outcome (p. 301). This is the physical activity experience at each station and the learning outcomes and social interactions from family engagement. These studies will allow IMSM to measure engagement in the Qualifying Zone, which will give indications as to the visitors' ability to "guide and construct their own knowledge" (Fisher, 2023, p. 103).

Touching or moving elements within an exhibit do not constitute an engaging experience (Hamaker & Pederson, 2023, p. 106). Active Prolonged Engagement, or "APE," as defined by the Exploratorium in San Francisco, measures success through "tracking, timing, and analyzing visitors' behavior at individual exhibit elements" (Hamaker & Pederson, 2023, p. 107). This is the root of the first study, QZE (Qualifying Zone Engagement). It looks specifically at how visitors within the target audience (identified as children aged 8-14) are using the Qualifying

Zone. The specific interactive functionality type most used within the Qualifying Zone is “process replication” -- or activities that “emulate or recreate a real-world activity” (Hamaker & Pederson, 2023, p. 109). Engagement can be measured as the visitor observes and recreates the activity or process (ibid.), examples of which are pit crew or driver tasks/experiences. Another type is “information reveal” as demonstrated with the dissected car, allowing the visitor to interact with the exhibit to receive information about the specific parts of an Indy car (Hamaker & Pederson, 2023, p. 108).

## **Research Plan**

### **Study #1: QZE (Qualifying Zone Engagement)**

#### *Research Details*

QZE will focus on the circulation and physical use of the activity stations within the Qualifying Zone. To do this, an observation of families with children ages 8-14, focusing on the child participants, will be conducted. The study will focus on this age group as it was specifically requested by the IMSM staff (Apollos, Brenneman, and Dunbar, 2025, 1<sup>st</sup> class meeting). It will center around the following guiding questions: 1) What parts, if any, of the Qualifying Zone are visitors using? 2) How long do visitors spend at stations, if at all? and 3) How are families using the stations together, if at all? These questions and the method of the study (observation) were identified as ways of measuring engagement and tracking behaviors of a new target audience of families with children 8–14 years old for the museum, that might provide information about the Qualifying Zone. Understanding how visitors use the Qualifying Zone will allow the IMSM to adjust signage as well as staff/volunteer training as needed because the physical layout of the space cannot be altered, as well as understand the potential desires and interests of this new-to-IMSM audience (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting).

## Rationale

The method of random sampling was designed to reduce biases and promote a potentially greater range of observations by selecting every third family with children aged 8-14 (Diamond et al., 2016, p. 49). Data collectors are advised to make their best judgement and estimate the ages of children, as they should not interfere with the visitors' experience of the Qualifying Zone by asking the children's specific ages. This allows the IMSM to utilize purposeful yet random selection. For the observation, the data collector will choose one child who appears to be aged 8-14 as the priority or focal visitor to observe (Diamond et al., 2016, p. 63). This will allow the IMSM to see how the target audience for the Qualifying Zone are using that gallery in the museum, designed with their engagement in mind (Apollos, Brenneeman, and Dunbar, 2025, 1st class meeting). Consideration will need to be given to the month, season, and time of day that the observations will take place (Diamond et al., 2016, p. 53). These factors will influence and could potentially bias the results of the observation. To help resolve potential biases, observations should be conducted on varying days and at varying times (Diamond et al., 2016, p. 53).

The study protocol (Appendix A) states the materials needed to conduct the observation, how to select participants, and where to stand to collect data. While a cell phone is ideal for tracking the time, a stopwatch could be used – a standard watch is not recommended as it lacks the “lap” function which will make time tracking more efficient. When a “lap” is set, that duration of time is isolated and recorded as a separate event. This will be useful for recording time at each station and wait time (Nelson & Cohn, 2015, p. 30) This can also be used to eliminate non-station time, such as when the focal participant is moving through the Qualifying Zone between stations or when the focal participant is not using a station, but also not waiting to use another station. Any non-station time should be noted in the Additional Notes section along with any notable activities – such as pausing to talk to other guests, talking on a cell phone, or assisting smaller children, for example. These non-station times will still contribute to the

group's overall time at the Qualifying Zone yet not be due in part to an aspect of the Qualifying Zone's stations or things that are likely in the control of the museum.

The location the data collector will stand at was determined based on sightlines within the Qualifying Zone area. By standing near the Fuel Station, they can see the entrance of the Qualifying Zone without impeding other guests by blocking access to other stations. Due to the size of the Qualifying Zone area, it is recommended that the data collector move as necessary to maintain sight of their focal individual. They should not, however, follow too closely so that the child or group feels uneasy. Should any observed group approach the data collector and request that they are not observed/recorded, the data collector should note that on the observation sheet (Appendix B) and move to a new group. The data from the rescinded group should be destroyed after observations for that day are complete and not included in any analysis (Back & Spence, 2022, p. 185). This will protect the privacy and wishes of the group who withheld consent. As noted in the protocol, visitors will be made aware of observations taking place by a sign at the entrance of the Qualifying Zone. The observation sheet should be printed double-sided to ensure that the observation data is not confused between participants by potentially mixing observation sheets. Overall, consistency in how the observations is recorded, primarily regarding time formats, should be clear. If someone other than the data collector inputs data into the spreadsheet for analysis, the task is not complicated and reduces the risk of errors.

The observation sheet will be used to track one family group – and more specifically, one focal individual (a child aged 8-14) through their time in the Qualifying Zone. Only one sheet should be used per observation. This will ensure that the data collection will remain organized and multiple points of data can be analyzed to give a larger picture of how the Qualifying Zone is used by its target audience and their families (Diamond et al., 2016, p. 54). The observation sheet has an area for basic information, located within a dashed box, that will record group

composition, the time they enter and exit the Qualifying Zone area, and the general crowdedness of the Qualifying Zone. The group composition collects basic demographic information including the number of adults and children in the group, and general age ranges of the children present (Diamond et al., 2016, p. 54). This information, combined with the specific station observations, will allow the IMSM to understand if different group types experience the Qualifying Zone the same or diverse ways – or if it affects their visit. Understanding the average, as well as ranged distribution, of time spent in the Qualifying Zone will allow the IMSM to confirm or adjust their current expectations of visit time to the Qualifying Zone, which could affect the number of unique visitors to the Qualifying Zone each day. Understanding the crowdedness of the Qualifying Zone will give further insight into the length of time groups spend in the area, as well as the number of stations they visit.

The station observations are grouped by overarching topics, as defined by the IMSM: Rookie, Pit Crew, Driver, and Strategy Team. Each area in the Qualifying Zone is identified not just by name, but by color and a symbol. These are included in the groupings on the observation sheet to assist the data collection in identifying each station (Diamond et al., 2016, p. 121), as not all individual stations have their names identified. With the exceptions of the Driving Simulator and the Dissected Car stations, each station's observation section is the same. This allows the data collector to become easily familiar with the setup and provide uniformed data for all stations. Because the Driving Simulator and the Dissected Car stations do not have information signage or labels, this observation topic has been removed from those boxes. To assist with the ease of observation, most topics/questions require only a check mark or circling an option, which is indicated for each statement. Recording the order that groups visit each station, and whether they return to a station, will be able to identify potential bottlenecks when combined with wait

time and time spent information, as well mapping an average path or flow through the Qualifying Zone (Hein, 1998, p. 104).

For each station, the data collector will record the amount of time spent at the station and any wait time. In discussing the Qualifying Zone station use with Apollos, he agreed that understanding if wait times are influencing the behaviors of visitors would be important, and for stations such as the Driving Simulator, allow the IMSM to understand if they should adjust the length of the simulation (J. Apollos, personal communication, April 8, 2025). Similarly, Apollos stated that understanding if the group was assisted by staff or a volunteer, could allow the IMSM to understand whether the instructions were clear, or if there are no instructions for the station, if the activity felt intuitive and what adjustments might need to be made to clarify these issues (J. Apollos, personal communication, April 8, 2025). A brief area for additional notes is available on both sides of the instrument should the data collector feel additional information is useful (Nelson & Cohn, 2015, p. 30). This could be used to clarify group composition data, or specific use of a station. While this study is not specifically tracking disability or accommodation, it should be noted if guest requested an accommodation or whether it seemed or there was the appearance of a disability impacting the guest's ability to participate in the station activity in the "additional notes" section. This data may give clarification on whether a guest decided to skip a station or if they are an outlier for time tracking.

### Data Analysis

The data gathered from each completed observation should be entered into an Excel spreadsheet on Microsoft 365, where it can be analyzed. This should be created by the primary evaluator; however, they do not need to be the individual entering the data into the spreadsheet. The average and range of time spent at the Qualifying Zone and each station should be calculated. Averages, median, and range of time spent at all stations should also be calculated

(Silverman, 2025). These time tracking results will inform the IMSM how long it takes an average visitor to experience the Qualifying Zone and based on room occupancy limits determined by the IMSM safety protocols, they will be able to calculate an estimate of total visitors who could visit the Qualifying Zone in one day. Comparing this data to their own information on ticket sales will allow IMSM to understand if they should adjust the content within the stations, in terms of the digital content since the physical stations are not planned to be changed (Apollos, Brenneman, and Dunbar, 2025, 1<sup>st</sup> class meeting).

Analyzing the frequency that visitors skip stations and comparing this to data for those groups regarding wait times, whether another group is present, and the crowdedness of the Qualifying Zone, will inform the IMSM whether the stations are skipped due to external factors to the group or potentially due to personal preference or interest. External factors could be mitigated with additional staff/volunteer training to engage the visitors more and guiding them through the station, encouraging guests to rotate to a new station once they finish so that others may participate, or adding additional signs with instructional information and estimated time of the activity. Personal preference or interest could also be mitigated with staff/volunteer training to engage the visitors in talking about the stations, potentially spurring interest. Additional research may be needed if many guests are skipping a station due to reasons other than waiting time or crowdedness.

### Application

The information from this study can confirm or identify new bottlenecks within the Qualifying Zone. While the physical space of the Qualifying Zone cannot be modified, adjustments could be made with additional or clarified signs and instructions, as well as additional training for staff as needed to help direct the flow of visitors within the space. Understanding if stations are skipped, as explained above, could indicate stations which may

need more or clarified instructions. Stations repeated will allow the IMSM to identify activities and topics engaging and of interest to visitors – either due to their entertainment or topical value. Finally, these initial observations can help identify areas which need further study through interviews or focus groups to understand the qualitative understandings from visitors to the Qualifying Zone, such as matters of opinion and preference, prior knowledge, and emotional experiences.

## **Study #2: QZO (Qualifying Zone Outcomes)**

### **Research details:**

The QZO will identify the outcomes and benefits the Qualifying Zone has for families with children between ages of 8 and 14, and its demographics. To do this, a survey (Appendix D) will be conducted among families with children within the target age range. The study will be focusing on this specific age group because it was requested by the IMSM staff (Apollos, Brenneman, Dunbar, 1<sup>st</sup> class meeting). The guiding questions for this study are: 1) How, if at all, are visitors engaging with each Qualifying Zone station? 2) What, if anything, did visitors learn from the Qualifying Zone? and 3) Do children, ages 8-14, have a better understanding of motorsports after visiting the Qualifying Zone? The survey will be offered through Google Forms to simplify the data analysis process. Surveys, especially ones online such as Google Forms, allow respondents to remain truthful about their experiences as they can fill out the survey anonymously (Diamond et al., 2016, p. 75). Google Forms was selected for the ease of conducting the survey as the website generates basic response data after responses are collected. This study will allow the IMSM staff to identify the strengths and weaknesses of the Qualifying Zone (Renaissance of East England, 2009, p. 15).

## Rationale

The beginning of the instrument has descriptions for each Qualifying Zone station. This ensures the respondents understand which station is being discussed for the rest of the survey. Each station has its own question allowing respondents to rate their level of engagement. This choice caters to the needs of the team at IMSM because they voiced their interest in gauging the level of engagement for each station (Apollos, Brenneman, Dunbar, 2025, 1<sup>st</sup> class meeting). Some of the survey questions ask about the interactive elements within the stations. This allows respondents to express what stations they enjoyed and which ones they did not. By asking these questions the IMSM team can highlight changes that might need to be made throughout the Qualifying Zone to increase interactive engagement of visitors. Allowing respondents to discuss the most memorable part of the Qualifying Zone identifies the key takeaways visitors are having in this part of the museum (Renaissance of East England, 2009, p. 14). The last portion of the survey involves six demographic questions. These questions will allow the IMSM team to better understand the people who are using the Qualifying Zone. These questions will also identify other prominent age groups present in this area other than the intended focus age group of eight- to fourteen-year-olds. There are both close-ended and open-ended questions present within this survey. The open-ended questions allow visitors to expand on their experiences in the Qualifying Zone and express their own thoughts (Taylor-Powell, 1998, p. 5). Open-ended questions are crucial for this study as it focuses on identifying the key outcomes and benefits visitors have gained from the Qualifying Zone. In the survey, respondents are asked to rate each station based on how engaging they are. The rating scale is ideal for measuring the attitudes of respondents, which will provide the IMSM staff with knowledge about the popularity of each station (Taylor-Powell, 1998, p.7).

The study's protocol (Appendix C) states the study will require a small table and chairs at the entrance of the Qualifying Zone for respondents who might want to sit down while they fill

out the survey. The table and chairs are essential for this study to ensure respondents feel comfortable while filling out the survey and are taking their time. This also ensures that respondents with disabilities can have a place to sit down while they fill out the survey. The table also provides a surface for the QR code paper cutouts to lay, so the evaluation team does not have to balance too many things in their hands. The table will be placed in the left-hand corner of the entrance. This location is ideal because the right side of the entrance would be blocking traffic and entrances to other parts of the museum. The evaluation team will ask every third family with children between the ages of eight and fourteen. This ensures that the sampling remains unbiased and random (Diamond et al., 2016, p. 49). Selecting families with children in this age range allows the IMSM to receive data based on their attended audience for the Qualifying Zone (Apollos, Brenneman and Dunbar, 2025, 1<sup>st</sup> class meeting). Having a five-dollar voucher to the gift shop as an incentive encourages visitors to take part in the survey and give their honest opinions. Incentives are also a useful way to motivate people to take the survey (Diamond et al., 2016, p. 49). The protocol explicitly states that parents should be the ones to fill the survey out. The questions within the survey are explicitly designed for adults to answer. If a child tried to answer these questions, they would have trouble articulating the responses that are needed to fill out the survey effectively.

### *Data Analysis:*

The data analysis protocol remains simple. After the survey response collection is done, the evaluation team will analyze the data organized in Google Forms and enter it into a spreadsheet. This ensures the data will be kept in a secure location with multiple copies available (Back & Spence, 2022, p. 191). Each question will be a row in the spreadsheet and each respondent a column. For open-ended questions, it would be beneficial to decide a coding format to reduce the data for those questions. Coding identifies the “core similarities” within open-

ended responses, which makes analyzing data more efficient (Diamond et al., 2016, p. 95). Once all responses are entered into the spreadsheet, it is crucial to identify key themes within the responses, such as mean, median, and mode (Silverman, 2025). These themes will mainly highlight numerical data, such as the most frequent answers and the average. Identifying the themes will allow for key similarities and differences between responses to be discussed and recorded. The data for the questions that involve respondents to rate would best be presented on a graph (Diamond et al., 2016, p. 86). This allows for the trends in each answer to be clearly identifiable. Qualitative, open-ended questions should be presented in a different manner from the quantitative, close-ended questions. When drawing conclusions from close-ended questions, it is best to present the data by using graphs, charts, and tables. While drawing conclusions from qualitative questions, it would be beneficial to identify the common themes and patterns within the responses (Renaissance of East England, 2009, p. 58).

### Application:

The information from this study can potentially identify what motorsports information young visitors are gravitating to and remembering. This could inspire future topics for exhibitions that cater to the visitors' interests. Since this space and its interactives are new for the IMSM, this study could highlight the interactives that are working and the ones that might need to be restructured. While the physical structure of the Qualifying Zone cannot be changed, there could be edits and changes made to the labels and instructions if the survey responses deem it is necessary. If the interactive elements in the Qualifying Zone are highly rated, the IMSM could be inspired to create more interactives throughout the museum that are like the ones featured in the Qualifying Zone. Overall, this study could lead to an array of new discoveries and ideas for the IMSM staff.

## **Plan Conclusion**

This plan was informed by observations made in the Qualifying Zone during a team visit to the Indianapolis Motor Speedway Museum, course readings, and literature reviews. It was also formed to directly address the IMSM staff's interests in how visitors are engaging with the activity stations, what information they are absorbing during their duration at each activity stations, and the potential bottlenecking issue within the space. The research objectives of demographics, circulation and physical use of the space, social interactions, and experience assessments were then implemented throughout the two studies for a research plan. A visitor studies plan such as the one proposed can give valuable insight on the demographics of IMSM, and how the Qualifying Zone affects their experience within the museum. It can generate a better understanding of the Qualifying Zone as a whole and a better understanding of its target audience, 8-14-year-olds, as well as their wants, needs, and behaviors. Lastly, it will clarify how IMSM can begin to build relationships with local Indianapolis families.

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## **Appendix A: QZE: Qualifying Zone Experience Protocol**

1. Purpose: This study is being conducted to gain a better understanding of the use of activity stations and social interactions in the Qualifying Zone. This study will help identify popular activities, whether families are participating together, and how long people are staying at each station.
2. Supplies Needed:
  - a. 1 observational sheet per family (have 10 printed out per observation day)
  - b. Clipboard
  - c. Pen/Pencil
  - d. A phone with a watch and stopwatch apps/programs
  - e. A sign to indicate observation in process
    - i. The sign will be 18x24 inches and located at the entrance to the Qualifying Zone on a large easel. The sign, which will be on mounted board with the Indianapolis Motor Speedway symbol on it, will say “Observational Study in Progress!”
3. Set Up: The sign will need to be set up outside the Qualifying Zone entrance, clipboards will need to have sheets on them, ready for use, and pens and pencils should be ready to use.
4. Location: The data collector will stand in the middle of the Qualifying Zone near Tire Touch & Feel and Agility Challenge. This will ensure they have an adequate view of the entrance for incoming guests. The observer can move as needed, but they should not follow closely or impede guests’ visit.

5. Sampling: Select every third family that has a child aged 8–14. If the family has multiple children within that age range, choose the child closest to you. This randomized sampling method will help eliminate bias which could negatively influence the study results.
6. Participants: The focus of this study is tracking children aged 8-14. If there is more than one participant within that age range in a group, select one child to be the focus. Use your best judgement when estimating the age of the children.
7. Recruitment, Incentives, and Refusals/Acceptances: Because this is a non-obtrusive observational study, recruitments, incentives, and refusals/acceptances for participants are not needed.
8. Instrument Details:
  - a. Put the date and your name at top and how crowded it is at the time of data collection.
  - b. Make note of the time the family entered the Qualifying Zone, and when they leave. Use a consistent format (either 12 hour with AM and PM, or 24 hour)
  - c. Note the family composition via numbers. Circle any age ranges of children present.
  - d. In the “Visit Order” box for each station, write the order which they visit (1, 2, 3 etc.)
  - e. Write a check mark in the box if children, adults, and looked at the station, but no one in the group participated or engaged/touched, whether another group was present or engaging. Also add a check mark if they went back to the station and repeated the activity at any point during their time in the Qualifying Zone.
9. Reminders During Data Collection

- a. Follow the participant from a distance but ensure as the data collector, there is a clear line of sight of them. The area between Tire Touch & Feel and Agility Challenge has enough space to observe, but the data collector may need to move more for the Driving Simulator at the back of the Qualifying Zone.
- b. Families may use stations in any order or skip stations. When a family begins to engage with a station, this includes reading the sign or instructions, begin the stopwatch on your phone. The lap feature on the stopwatch can help track new stations rather than resetting each time.
- c. Record comments made about a specific activity station in its own box.
- d. Record the amount of time spent at the station. Do not reset the stopwatch, if possible.
- e. If the participant or family makes remarks to indicate their mood during their time in the Qualifying Zone, or if you overhear comments regarding use of the stations (ease or complications), please put them in the “Additional Notes” section. This is also where you would record if the family required or used any accessible accommodation.

#### 10. Reminders After Data Collection

- a. Once they leave the Qualifying Zone, record the time they left. Total time spent in the space will be calculated when entering the data into a spreadsheet. Be sure to check the times for each station and review the observation sheet for completion of all data. Add any additional notes before starting a new observation so that this information is fresh.
- b. If a previously tracked family returns to the Qualifying Zone after leaving, there is no need to continue tracking if you have already moved onto a new family group.

However, if you can remember, make a note on their tracking sheet in the “Additional Notes” section.

11. How To Resume: Because this is an observation, there is no resuming or interruptions for the data collector. The data sheet will still be used for data entry. Once an observation is over and all data is recorded, use a new instrument and reset the stopwatch app.
12. Clean up: The sign, supplies, not including the collected data, will be stored away or given to a lead on duty to secure in a room.
13. Data Storage: Because the data collection is done on paper, it will be stored in a folder with an accurate date on it. These folders will be stored in the secure office of a lead, preferably in a room or filing cabinet with a lock.
14. Data Entry: The data will be entered into a spreadsheet in Microsoft Excel.
  - a. Each column will be labeled to plug in information from the observational sheet. This includes crowdedness, how long the family spent in the Qualifying Zone, how many adults and children were in the group, the age range of the children, who participated in the stations, and any additional comments.
  - b. Once the sample size of 40 observations is met and all data has been entered, the evaluator will analyze to ensure accurate conclusions.

## Appendix B: QZE Observation Sheet

### Qualifying Zone Observation

Use one sheet per group; closest/best estimates for ages & times  
Select ONE child aged 8-14 in group to track

Date: \_\_\_\_\_ Name: \_\_\_\_\_

Area: ROOKIE (yellow)

#### General Info

Time In: \_\_\_\_\_ Time Out: \_\_\_\_\_

Group Composition: (best estimates on children ages)

# Adults \_\_\_\_\_ # Children \_\_\_\_\_

Child Age Range(s): (circle all) 0-7 8-14 15+

QZ Crowdedness: (circle one)

Light (a few or most stations empty)

Moderate (most/all stations full, but not much waiting)

Heavy/Crowded (most/all stations full with waits)

#### Soft Play Zone

Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY (circle one)

Label/Screen: (circle) Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

Area: PIT CREW (blue)

#### Fuel Station

Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY (circle one)

Label/Screen: (circle) Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

#### Tire Touch/Feel

Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY (circle one)

Label/Screen: (circle) Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

#### ADDITIONAL NOTES

#### Pit Stop Challenge

Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY (circle one)

Label/Screen: (circle) Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

Area: DRIVER (bright green)

**Agility Challenge** Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY *(circle one)*

Label/Screen: *(circle)* Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

**Steering Challenge** Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY *(circle one)*

Label/Screen: *(circle)* Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

Area: STRATEGY (orange)

**Strategy Challenge** Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY *(circle one)*

Label/Screen: *(circle)* Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

ADDITIONAL NOTES

Area: independent (white)

**Dissected Car** Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY *(circle one)*

Label/Screen: *(circle)* Looked at Pointed to

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

**Driving Simulator** Order Visited

Time Spent: \_\_\_\_\_ Wait Time: \_\_\_\_\_

Skipped Station was EMPTY BUSY *(circle one)*

Children participated

Adults participated

Looked at station but didn't participate

Another group present at some point

Waited  Collaborated  Skipped

Repeated station at any time

Received assistance from staff/volunteer

## **Appendix C: QZO: Qualifying Zone Outcomes Protocol**

1. Purpose: This study is being conducted to get a better understanding of each station's interactive elements in the Qualifying Zone. This study will allow us to identify the strengths and weaknesses of the Qualifying Zone for families with children ages 8-14.
2. Supplies:
  - a. Small Table
  - b. Four chairs, extras for visitors to sit down while doing the survey.
  - c. Sign stating that a survey is being offered and conducted.
  - d. QR code print out for visitors to scan
3. Set up: The table and chairs will need to be set up. (“March 16, 2025, Second Sunday in Lent THE GATEKEEPER’S RECORD”) Two chairs are reserved for the survey volunteers and the other chairs should be placed so visitors can utilize them while taking the survey. The sign will need to be set up next to the table. The sign will state: Surveys in progress!” The QR code sign will need to be printed off and placed on the table. Print off two extra copies.
4. Location: The table will be placed outside of the Qualifying Zone at the left of the entrance.
5. Participants: The focus of this study is families with children ages 8-14. Use your best judgement when estimating the age of the children. This is important to ensure there is no bias in selecting participants.
6. Sampling: Select every third family that includes children ages 8-14. If they have multiple children, only one child needs to be within the age range. Do not ask parents with visibly upset children. Do not select participants based on their appearance or mood, this can lead to bias. Only ask adults to fill out the survey.

## 7. Recruitment:

Introduction for visitors: “Hi, would you like to participate in a study that is being conducted by the museum? We are interested in receiving feedback on the qualifying zone since it is a new addition for the museum. All your responses will be anonymous, and the survey should only take around five minutes to complete. At the end of your survey, you will receive a \$5 voucher for the museum's gift shop. Would you help us?”

## 8. Incentives: A \$5 voucher for the museum’s gift shop.

## 9. Refusals/Acceptance: If a visitor refuses to participate, that is completely understandable. Keep a tally of all visitors that refuse, and take note of the time and day the refusal occurred. End the conversation with, “No problem, we hope you have a great rest of your day here at the IMSM!”

If they accept, show them the QR codes either on the sign or handouts. Inform them that they can scan the QR code with their camera, which will give them the link to the survey. Inform them that they may also fill out a paper survey if they prefer it.

Example Script: “Sounds great! If you scan our QR code, it will take you to the link to our survey and from there you can fill it out. There is also a paper option if you prefer it. Feel free to sit down while you take the survey. If you have questions, please let us know.”

## 10. Instrument Details: An adult should be filling out the survey.

## 11. Reminders during survey: Talk slowly when introducing the study. Answer questions to the best of your ability. Put emphasis on the \$5 voucher.

## 12. Reminders for after: Do not forget to thank them for taking the survey. Be sincere.

Example: “Thank you for taking the time to fill out the survey for the Qualifying Zone.

We hope you enjoy the remainder of your trip here at the Indianapolis Motor Speedway Museum.”

13. How to resume: You will recruit new people by following the introduction script, and picking every third participant.
14. Clean up: The table and chairs will need to be put away. The sign and cutouts should be given back to the evaluation lead.
15. Storage of data: The data will be stored and collected via Google Forms, so no action is immediately needed.
16. Data entry: Data will be entered into a spreadsheet in Excel. This spreadsheet can be found in a folder titled “QZ Survey Responses,” and the spreadsheet will be titled “QZ Survey” with the corresponding date. The folder can be found by searching for it in the search bar, or it will be pinned for ease of access. The columns will be divided into each survey question and rows designated for each respondent. This will allow for analysis to be conducted promptly. Questions that were open ended will identify common themes within the replies. These themes will then be entered into the spreadsheet using the same manner as close-ended questions, with the theme being the respondent's answer (Diamond et al., 2016, p. 99). This allows for the spreadsheet to remain easy to decipher and draw conclusions from. It is important to save multiple copies of the spreadsheet for backup purposes.

## Appendix D: QZO Survey

Link:<https://docs.google.com/forms/d/e/1FAIpQLScVPP4dt6snPgP0LbBPVMMFub5mDSXYDfQE51eN5j6U8YtK4SA/viewform?usp=header>

Thank you for taking the time to fill out a survey for the Indianapolis Motor Speedway Museum about your experience in the Qualifying Zone. Your feedback is and will remain anonymous. If you have any questions, feel free to ask the staff member you received the link from. Your responses matter. Thank you!

1. What, if any, activity stations did you and/or your companions participate in (select all that apply)?
  - VR Racing Simulator (Description: Where you can experience what it feels like to race three laps as an IndyCar driver)
  - Pit Stop Challenge (Description: Hands-on simulation where you get to experience the quick tire changes that happen in motorsports)
  - Soft Play Area (Description: Area designated for younger children where they can move the wooden car parts on the wall and pull apart a soft version of a race car.)
  - Dissecting Race Car (Description: A close-up view of all the parts that create a race car)
  - Touch and Feel Tires (Description: Hands-on experience of how heavy a race car tire and wheel gun are)
  - Agility Challenge (Description: Timed activity that measures reflects and compares them to professional race car drivers)
  - Fuel Station (Description: A close-up view of race car fuel hoses and its parts)
  - Steering Challenge (Description: Measures how fast you can turn the steering wheel to hit the green lights)

Strategy Challenge (Description: Firsthand experience of the choices pit crew members must make during a race)

I/We did not interact with any of the stations

2. If you participated in the activity stations, were the directions clear?

A. Yes

B. Somewhat

C. No

Explain your answer.

3. How engaging was the VR Racing Simulator (Select one answer)?

Did not engage with this station

Not engaging at all

Fairly engaging

Very engaging

4. How engaging was the Pit Stop Challenge (Select one answer)?

Did not engage with this station

Not engaging at all

Fairly engaging

Very engaging

5. How engaging was the Soft Play Area (Select one answer)?

Did not engage with this station

Not engaging at all

Fairly engaging

Very engaging

6. How engaging was the Dissecting Race Car (Select one answer)?
- Did not engage with this station
  - Not engaging at all
  - Fairly engaging
  - Very engaging
7. How engaging was the Touch and Feel Tires (Select one answer)?
- Did not engage with this station
  - Not engaging at all
  - Fairly engaging
  - Very engaging
8. How engaging was the Agility Challenge (Race Car Reflects) (Select one answer)?
- Did not engage with this station
  - Not engaging at all
  - Fairly engaging
  - Very engaging
9. How engaging was the Fuel Challenge (Select one answer)?
- Did not engage with this station
  - Not engaging at all
  - Fairly engaging
  - Very engaging
10. How engaging was the Steering Challenge (Select one answer)?
- Did not engage with this station
  - Not engaging at all
  - Fairly engaging

Very engaging

11. How engaging was the Strategy Challenge (Select one answer)?

Did not engage with this station

Not engaging at all

Fairly engaging

Very engaging

12. If there was a station in the Qualifying Zone you did not interact with, was there a reason? Please explain.

13. If you participated in the station interactives, was everyone you came with able to interact if they wanted to? If not, explain.

14. Rate your knowledge of motorsports (Select one answer).

Not knowledgeable

Fairly knowledgeable

Knowledgeable

Knowledgeable

15. Did the Qualifying Zone increase your interest in motorsports?

B. Yes

B. No

16. In your own words, how would you describe the Qualifying Zone?

--

17. What is your gender identity? Select one.

- Female
- Male
- Non-binary
- Other (please specify):
- Prefer not to say

18. What is your ethnicity? Select one.

- White
- African American
- Asian
- Hispanic/Latino
- Native Hawaiian/Pacific Islander
- Native American
- Other (Please specify):
- Prefer not to say

19. Are you an Indiana resident? Choose one

- Yes (Please specify what county):
- No (Please specify what state/country):

20. Please select all the age ranges that were present in your group:

- Under 10
- 11-18
- 19-29

- 30-40
- 41-51
- 52-62
- 63+

21. How many children accompanied you on your visit to the Qualifying Zone? Select one.

- 0
- 1
- 2
- 3
- 4+

22. If you had children accompanying you, please select their respective age groups.

- Up to 3 years
- 4-7 years
- 8-11 years
- 12-14 years
- 15+ years

You have completed the survey. The Indianapolis Motor Speedway thanks you for your time! Have an enjoyable day!